

**Carrier**

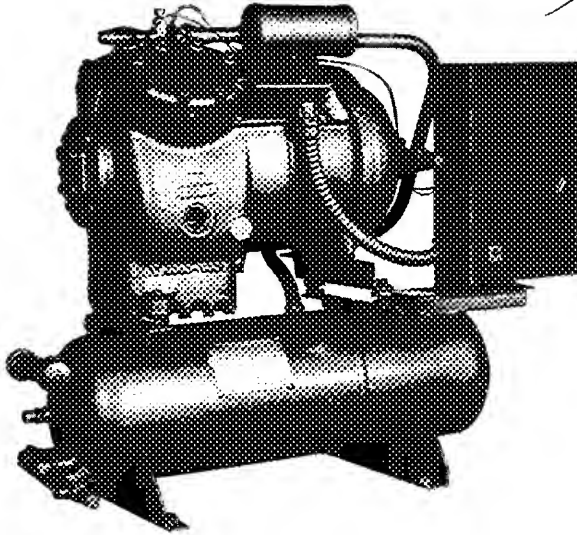
**06D,07D**

**Installation Instructions**

*Superseded by*

*06D, 07D-151*

*9/71*



**06D  
COMPRESSORS  
AND 07D  
HERMETIC  
CONDENSING UNITS**

07DA501005

6-65

Tab

4

Supersedes 6D21-1045 1-61

Litho in U.S.A.

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Codes C and MB (530706)

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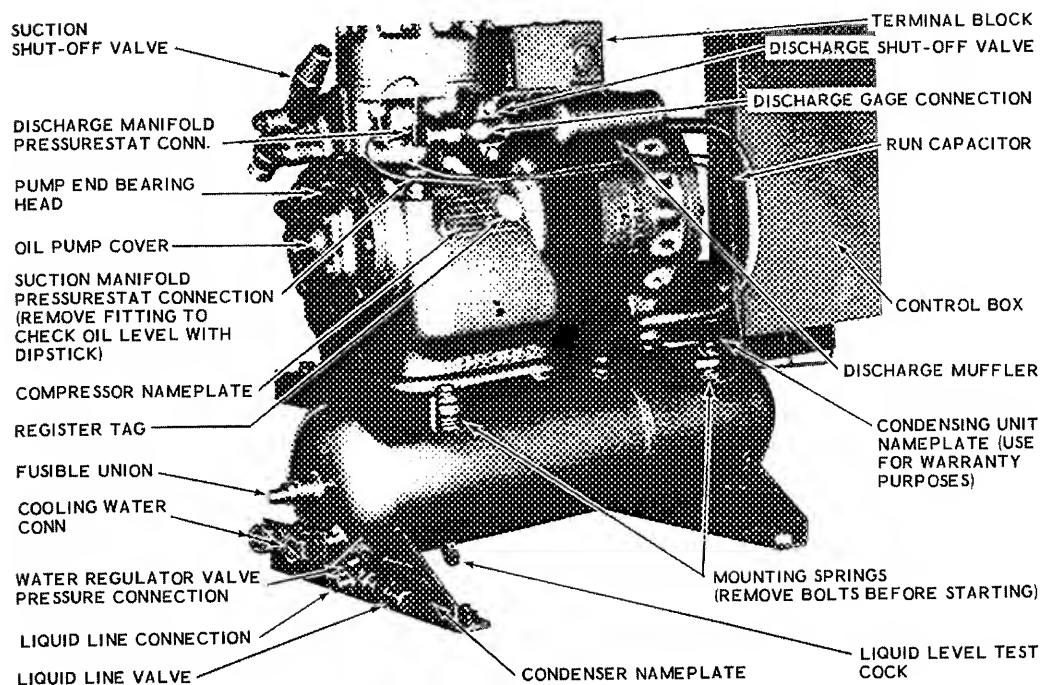
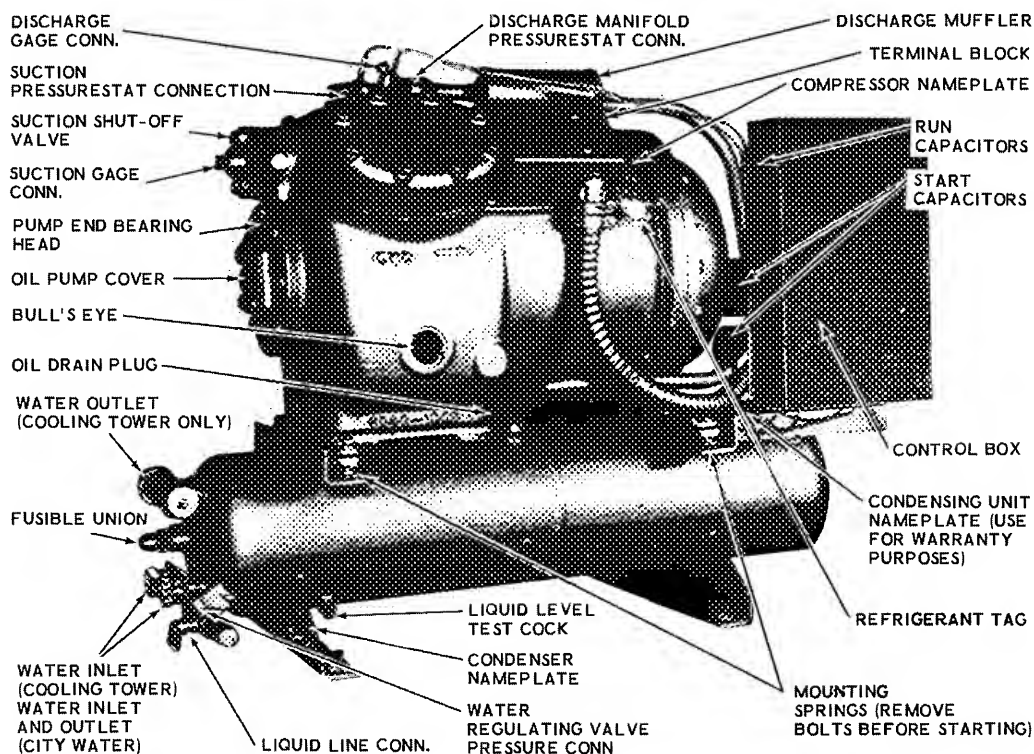
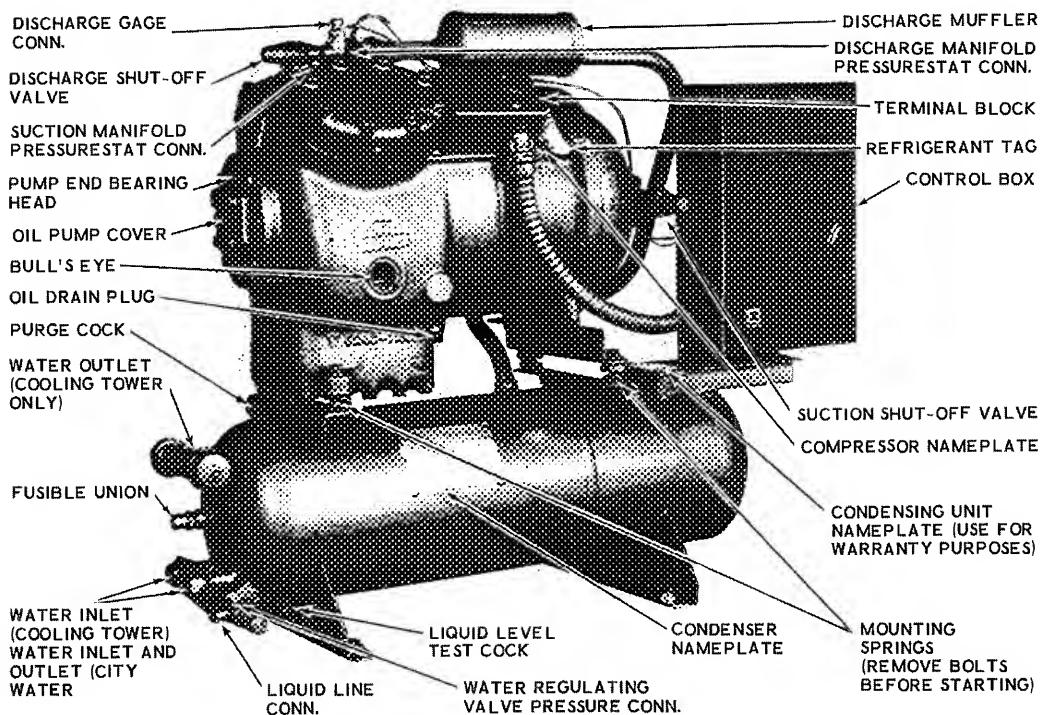


Fig. 1 - Typical 2 Cylinder Water-Cooled Condensing Unit  
(07DA102, Single-Phase Illustrated)



**Fig. 2 - Typical 4 Cylinder Water-Cooled Condensing Unit  
(07DA103, Single-Phase Illustrated)**



**Fig. 3 - Typical 4 Cylinder Water-Cooled Condensing Unit  
(07DA106, Three-Phase Illustrated)**

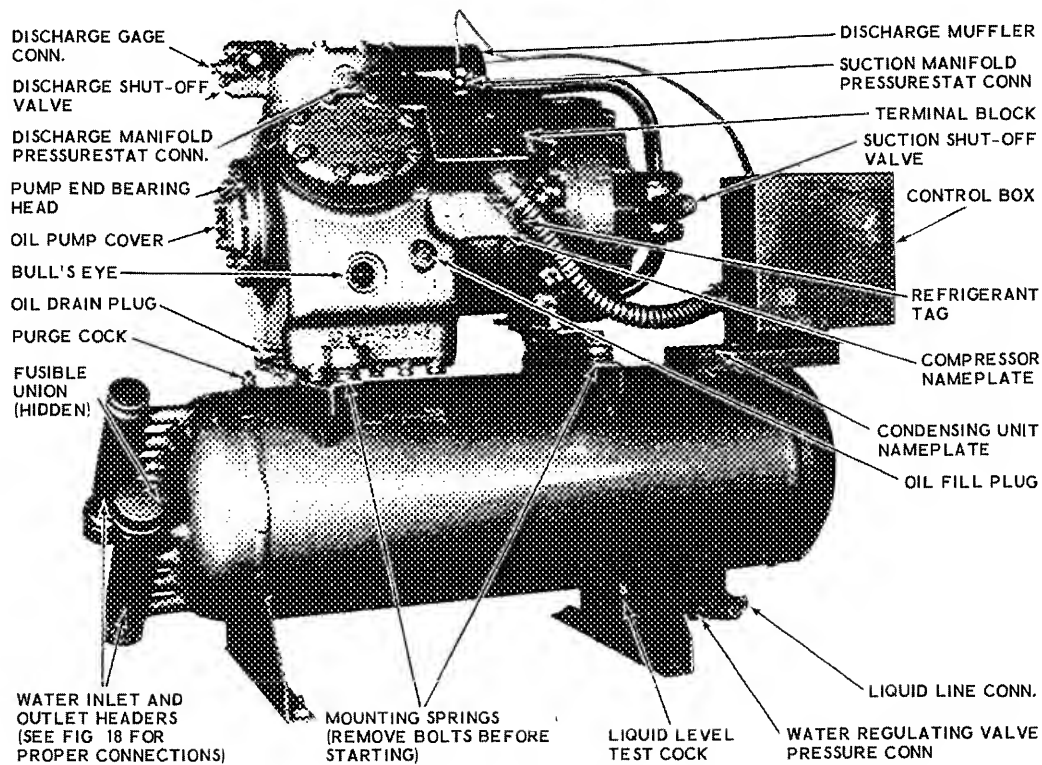


Fig. 4 - Typical 6 Cylinder Water-Cooled Condensing Unit  
(07DA210, Three-Phase Illustrated)

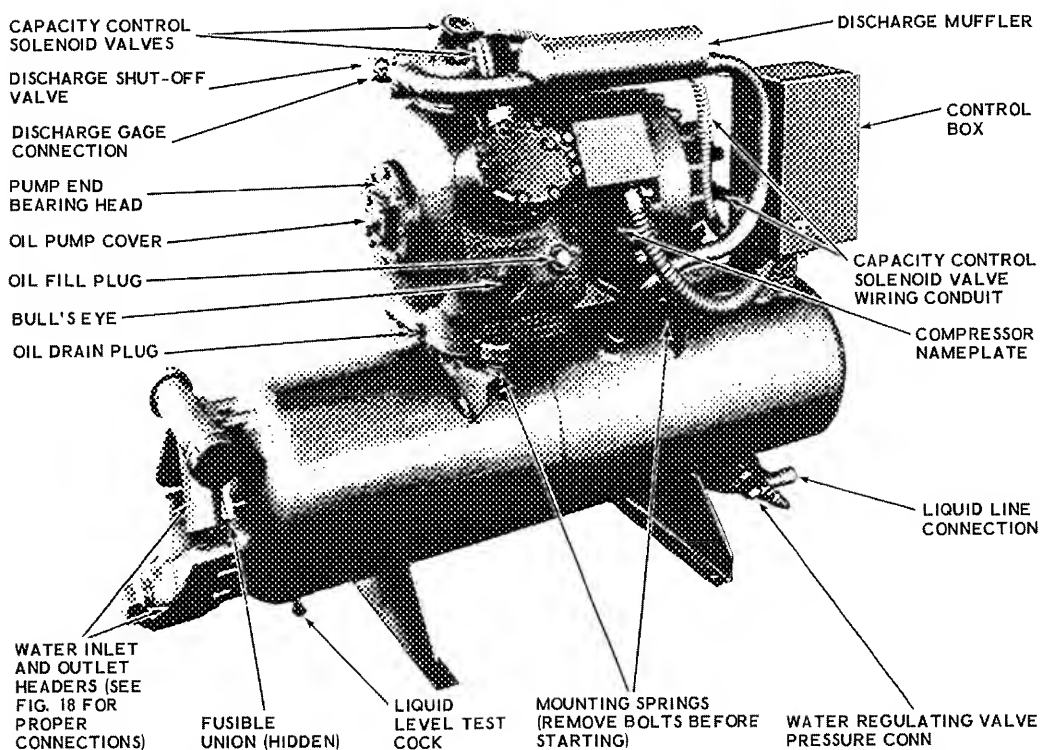


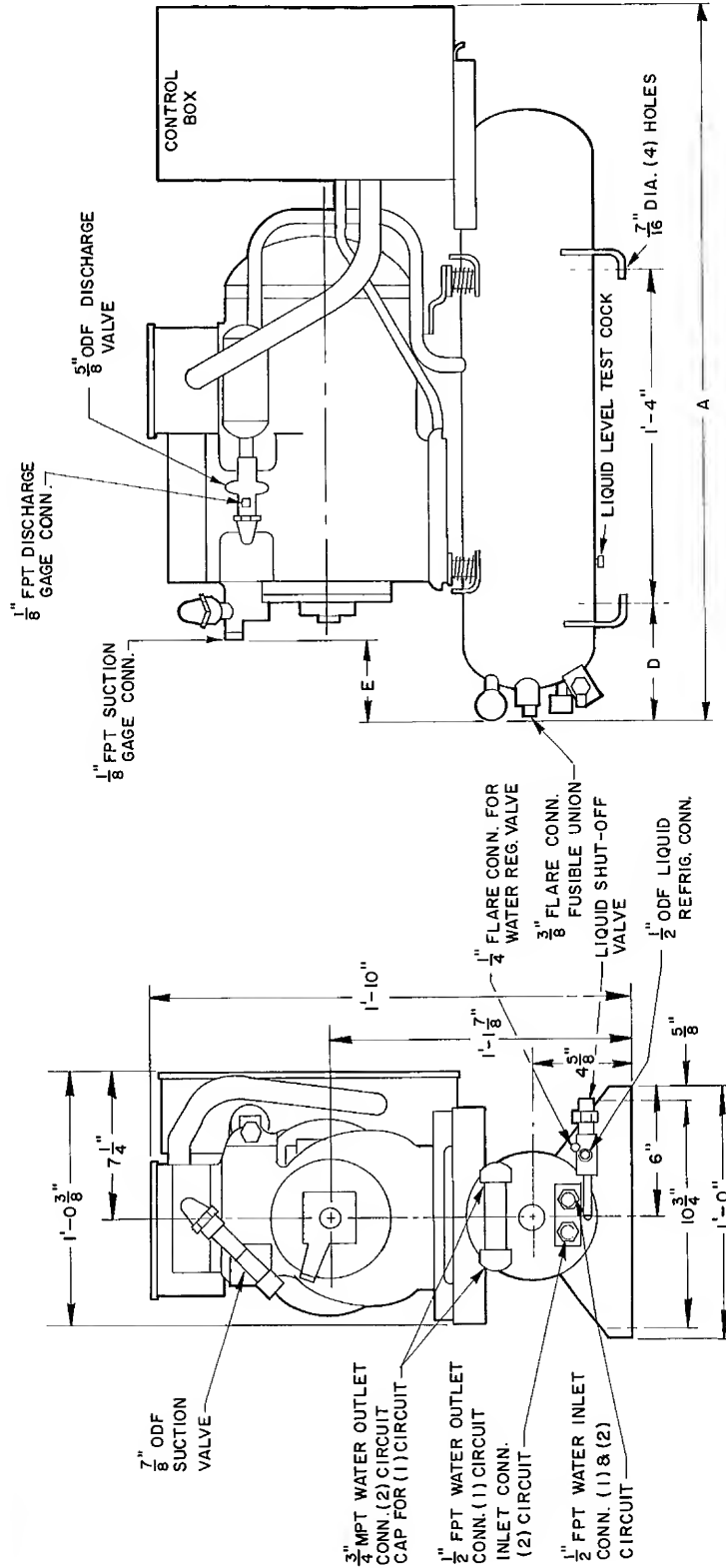
Fig. 5 - Typical 6 Cylinder Water-Cooled Condensing Unit - Capacity Control  
(07DA215, Three-Phase Illustrated)

UNIT MODEL	NET WEIGHT (LBS)	A	D	E
07DA102	181	2'-5 $\frac{1}{4}$ "	4 $\frac{5}{8}$ "	1 $\frac{3}{8}$ "
07DA203	190	2'-7 $\frac{3}{8}$ "	5 $\frac{7}{8}$ "	3 $\frac{1}{2}$ "

- NOTES
1. NET WEIGHT INCLUDES OIL BUT NOT REFRIG. CHARGE.
  2. OIL PUMP IS AUTOMATICALLY REVERSIBLE FOR EITHER DIRECTION OF ROTATION
  3. CONTROL BOX DRAWING 06D-201-E1
  4. MUFFLER DRAWING 06D-202-4

LIQUID STRAINER-DRIER  
CRANKCASE HEATER PKG.

YES ☐ NO ☐



Dimensions are approximate. Certified dimension drawings are available on request.

Fig. 6 - Dimensions for 07DA102 and 07DA203

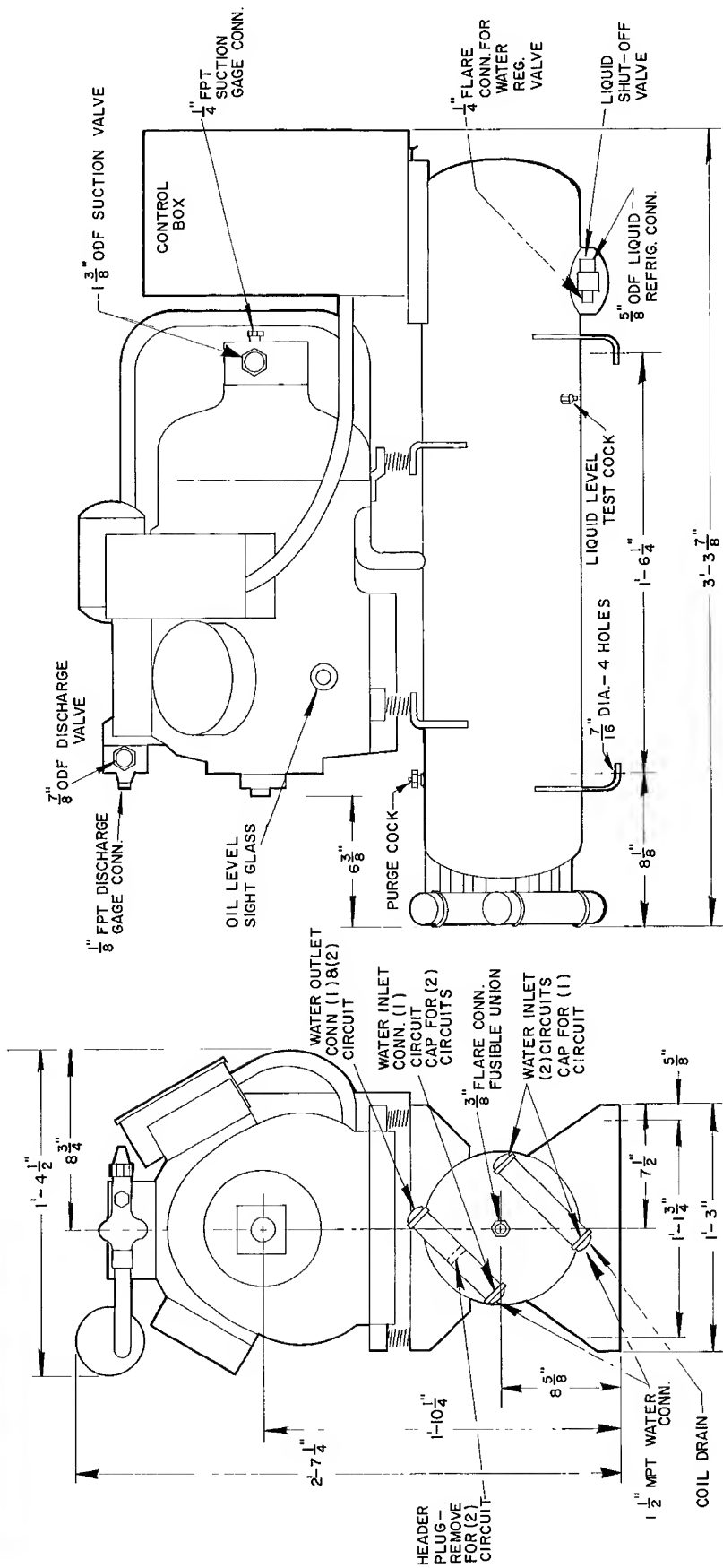


UNIT MODEL	CAPACITY CONTROL	NET WEIGHT (LBS)
07DA210	WITHOUT	475
07DB210	WITH	

- NOTES
1. NET WEIGHT INCLUDES OIL BUT NOT REFRIG. CHARGE.
  2. OIL PUMP IS AUTOMATICALLY REVERSIBLE FOR EITHER DIRECTION OF ROTATION.
  3. CONTROL BOX DRAWING 06D-201-E1
  4. MUFFLER DRAWING 06D-202-4

PRESS. ACTUATED CONTROL VALVE(S)  
 LIQUID STRAINER-DRIER  
 CRANKCASE HEATER PKG.

YES	NO
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<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>



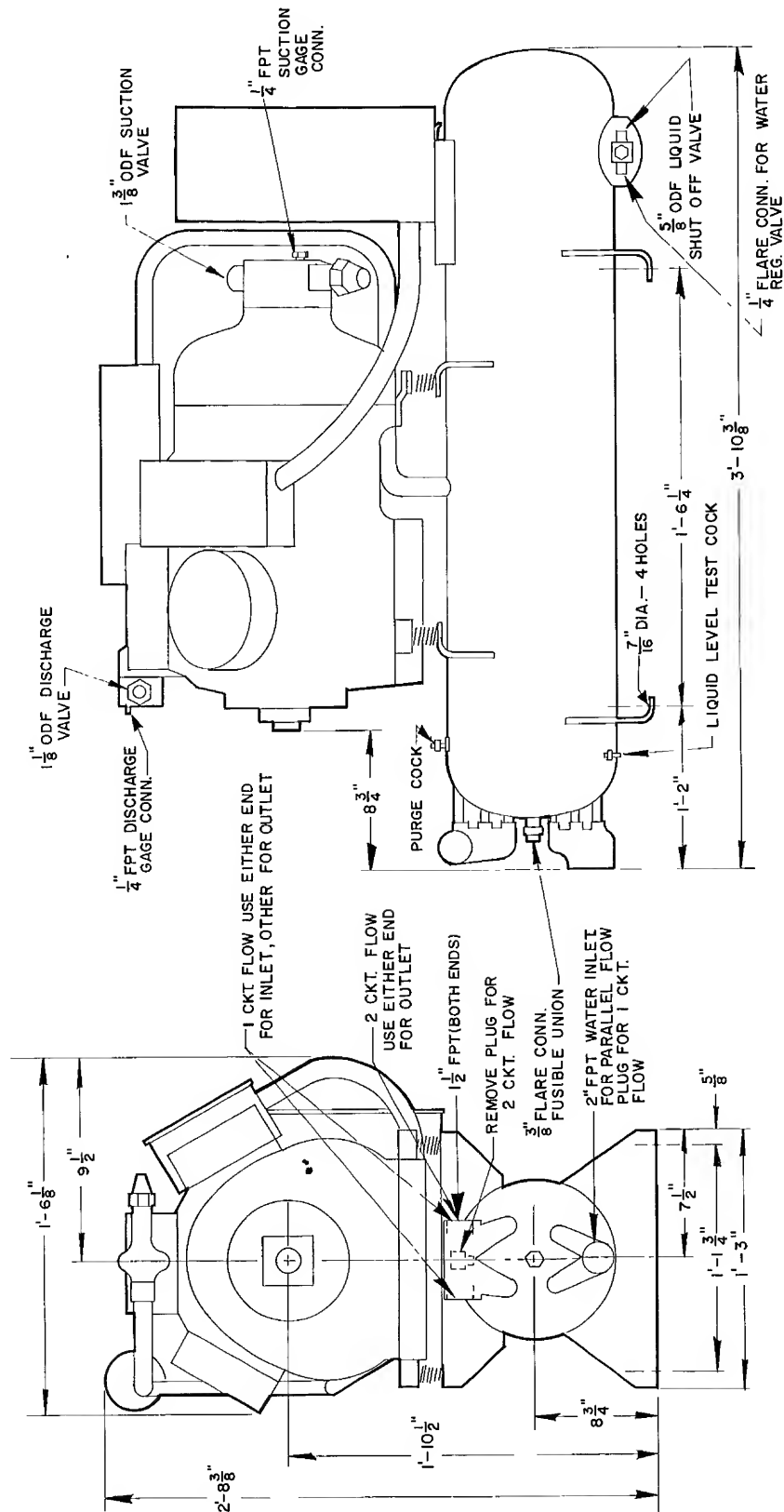
Dimensions are approximate. Certified dimension drawings are available on request.

Fig. 8 - Dimensions for 07DA210 and 07DB210

UNIT MODEL	CAPACITY CONTROL	NET WEIGHT (LBS)
07DA112	WITHOUT	580
07DA215	WITH	590

- NOTES.
1. NET WEIGHT INCLUDES OIL BUT NOT REFRIG. CHARGE.
  2. OIL PUMP IS AUTOMATICALLY REVERSIBLE FOR EITHER DIRECTION OF ROTATION.
  3. CONTROL BOX DRAWING 06D-201-E1
  4. MUFFLER DRAWING 06D-202-4

PRESS. ACTUATED CONTROL VALVE(S)	YES	NO
LIQUID STRAINER-DRIEF		
CRANKCASE HEATER PKG.		



Dimensions are approximate. Certified dimension drawings are available on request.

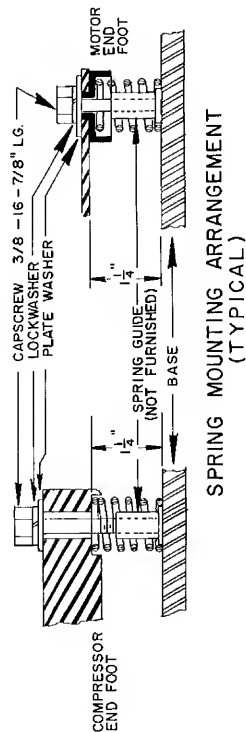
Fig. 9 - Dimensions for 07DA,DB112 and 07DA,DB215



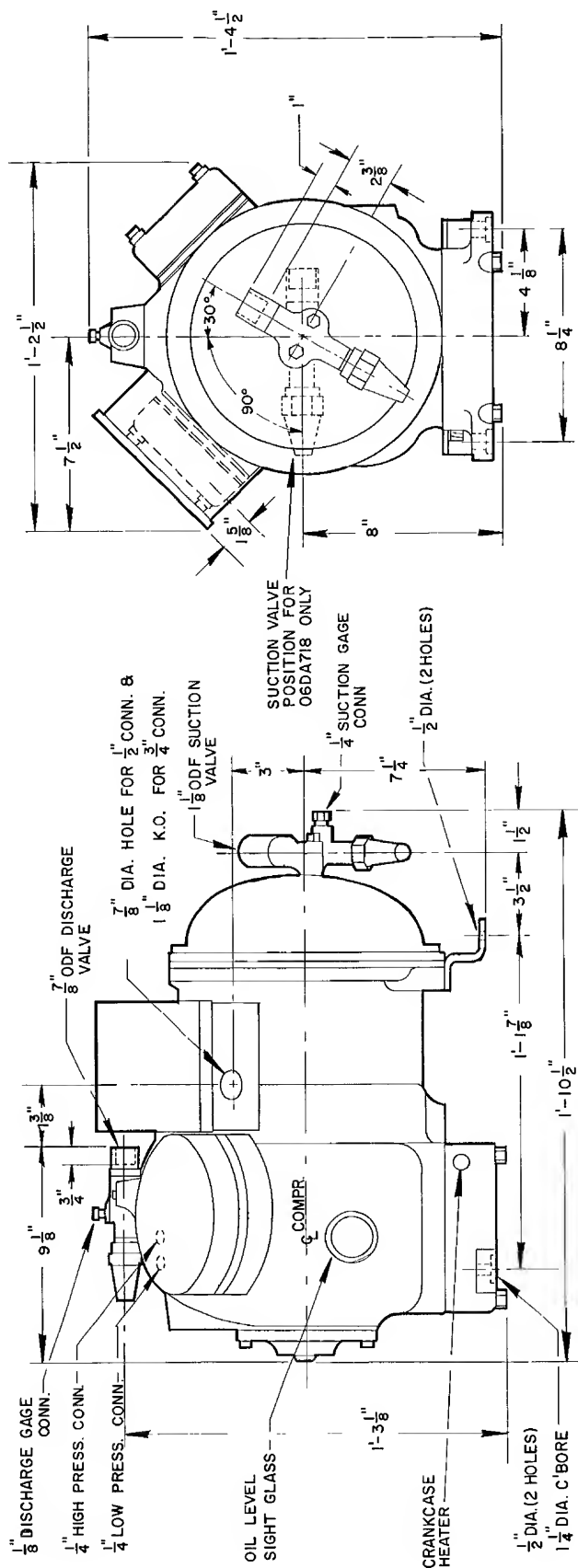
- NOTES.
1. NET WEIGHT INCLUDES OIL BUT NOT REFRIG. CHARGE.
  2. OIL PUMP IS AUTOMATICALLY REVERSIBLE FOR EITHER DIRECTION OF ROTATION.
  3. CONTROL BOX DRAWING 06D-201-E1
  4. MUFFLER DRAWING 06D-202-4

CONTROL BOX	YES	NO
MOUNTING SPRINGS		
MUFFLER		
CRANKCASE HEATERS		

MODEL	NET WEIGHT	OIL CHARGE
06DA718	210 LBS.	7 PINTS
06DA818	225 LBS.	

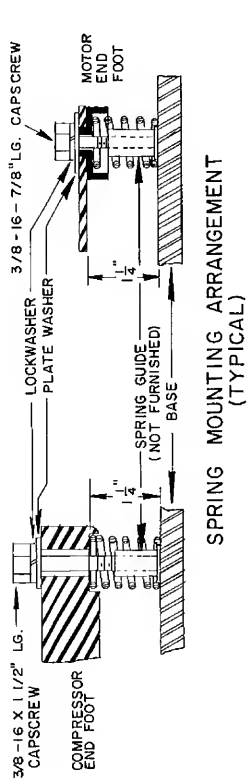


SPRING MOUNTING ARRANGEMENT (TYPICAL)



Dimensions are approximate. Certified dimension drawings are available on request.

Fig. 10 - Dimensions for 06DA718 and 06DA818



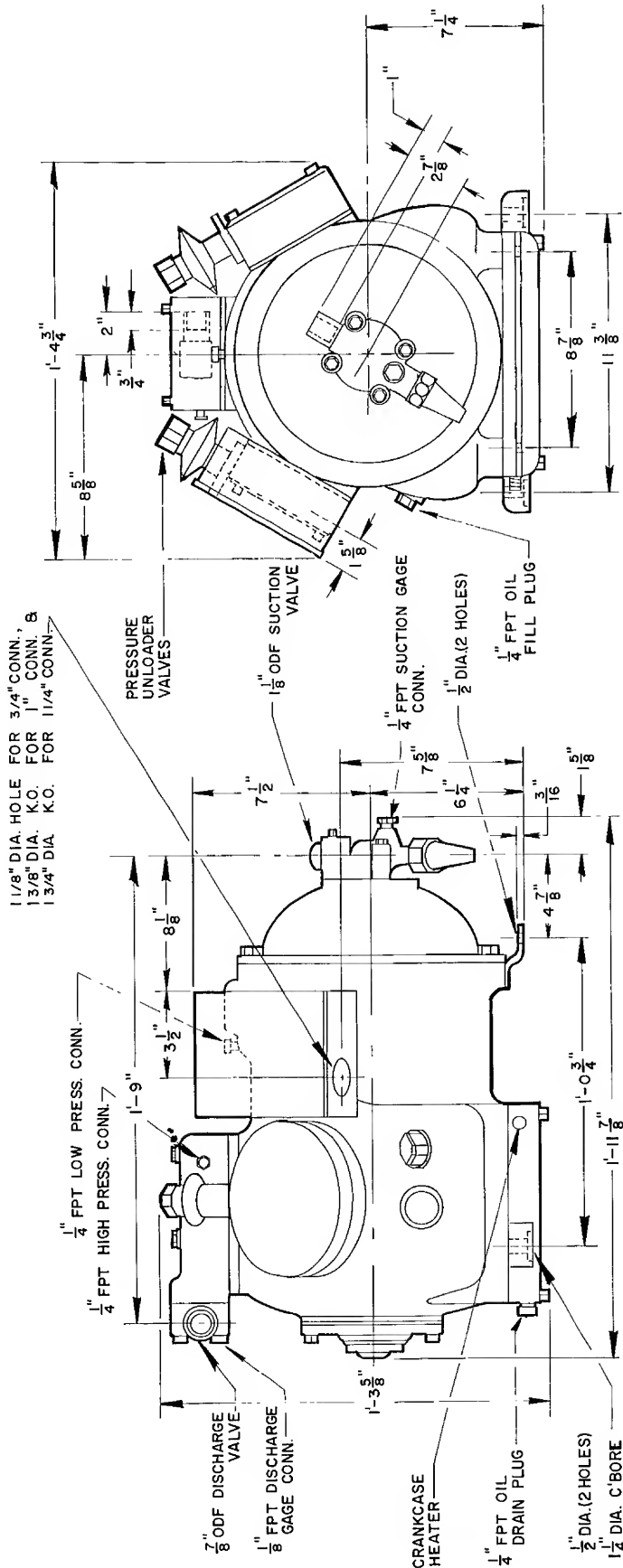
### SPRING MOUNTING ARRANGEMENT (TYPICAL)

NOTES

1. NET WEIGHT INCLUDES OIL BUT NOT REFRIG. CHARGE.
2. OIL PUMP IS AUTOMATICALLY REVERSIBLE FOR EITHER DIRECTION OF ROTATION.
3. CONTROL BOX DRAWING 06D-201-E-I
4. MUFFLER DRAWING 06D-202-4

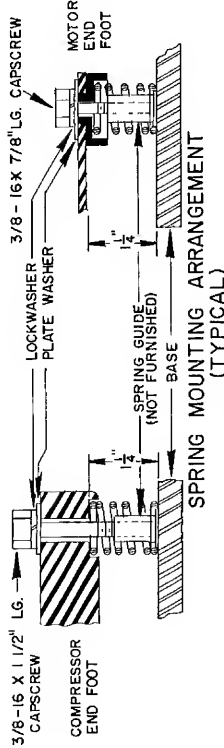
NET WEIGHT 270 LBS.  
OIL CHARGE 10 PTS.  
\* 06DA DENOTES NO UNLOADERS  
\* 06DE DENOTES 2 STEP PRESSURE  
ACTUATED UNLOADING

	YES	NO
PRESS. ACTUATED		
CONTROL VALVES)		
CONTROL BOX		
MOUNTING SPRINGS		
MUFFLER		
CRANKCASE HEATER		



Dimensions are approximate. Certified dimension drawings are available on request.

**Fig. 11 - Dimensions for 06DA824 and 06DE824**



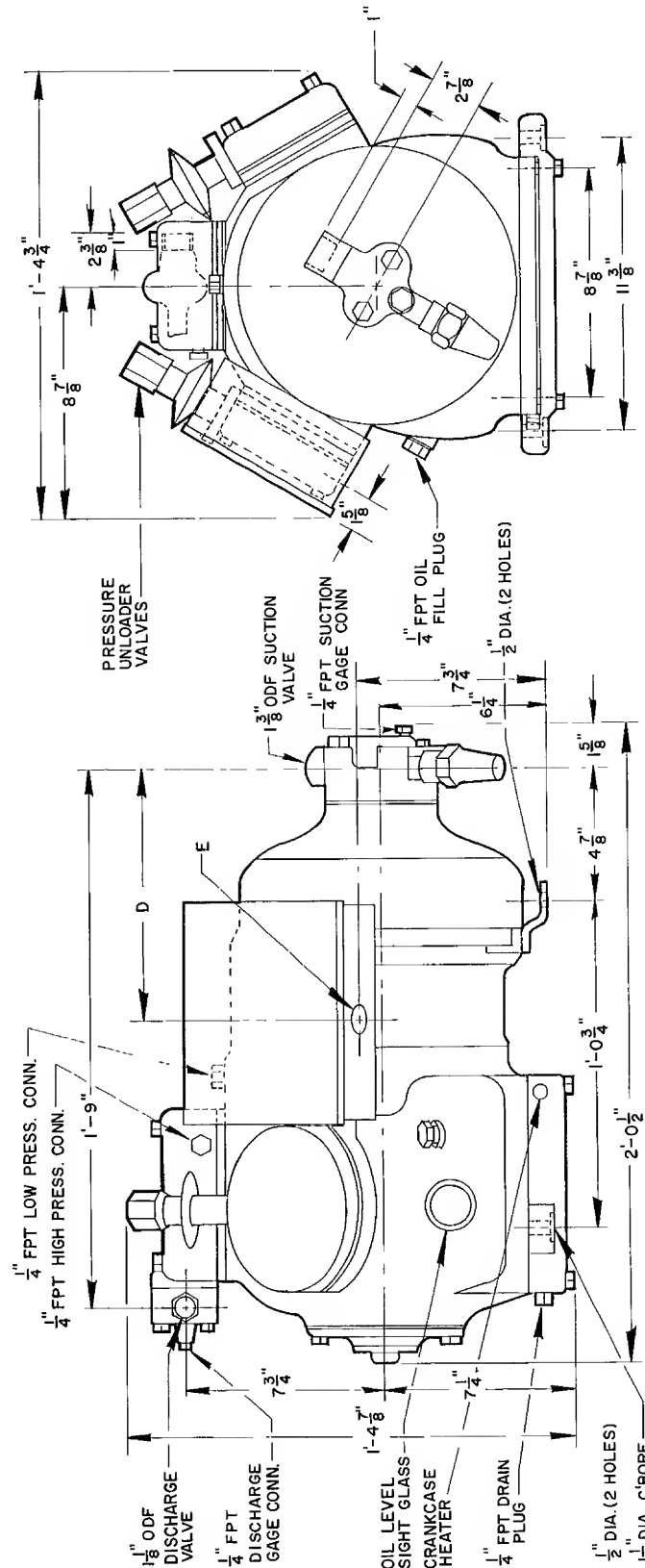
ELECTRICAL	D	"E" CONNECTION SIZES
208-3-60	8"	1 3/8" DIA. HOLE FOR 1" CONN. &
230-3-60	8"	1 3/4" DIA. K.O. FOR 1 1/4" CONN.
230-3-50	9"	1 7/8" DIA. HOLE FOR 3/4" CONN.
400-3-50	9"	1 3/8" DIA. K.O. FOR 1" CONN. &
460-3-60	9"	1 3/4" DIA. K.O. FOR 1 1/4" CONN.

MODEL	NET WEIGHT	OIL CHARGE
06D1337	285 LBS.	10 PINTS
06D1537		

\* 06DA DENOTES NO UNLOADERS  
\* 06DE DENOTES 2 STEP PRESSURE ACTUATED UNLOADING

- NOTES
1. NET WEIGHT INCLUDES OIL BUT NOT REFRIG. CHARGE.
  2. OIL PUMP IS AUTOMATICALLY REVERSIBLE FOR EITHER DIRECTION OF ROTATION.
  3. CONTROL BOX DRAWING 06D-201-E1
  4. MUFFLER DRAWING 06D-202-4

PRESS. ACTUATED	YES	NO
CONTROL VALVE(S)		
CONTROL BOX		
MOUNTING SPRINGS		
MUFFLER		
CRANKCASE HEATER		



Dimensions are approximate. Certified dimension drawings are available on request.

Fig. 12 - Dimensions for 06DA337, 06DE337 and 06DA537, 06DE537

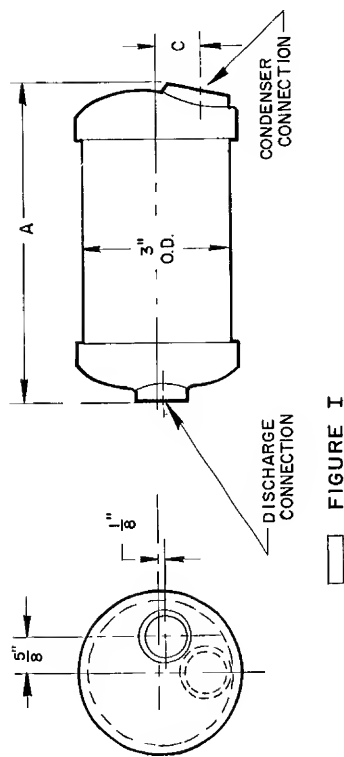


FIGURE I

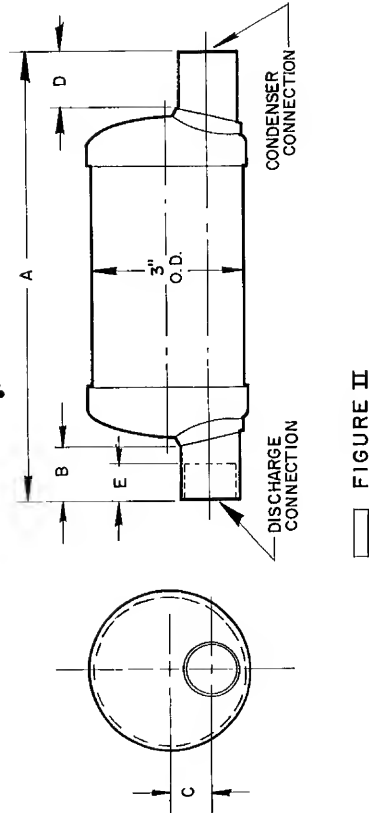


FIGURE II

MUFFLER PKG. NO.	FIG. NO.	DIMENSIONS					COND. CONN. INLET	DISCH. CONN. INLET	MTG.	MODELS USED ON
		A	B	C	D	E				
6D44-882	I	9 5/8"	—	5/8"	—	—	7/8" ODF	7/8" ODF	HORIZ.	06DA718 06DA818 06D-824
6D47-882	II	10 1/4"	1 3/4"	7/8"	3/4"	1/2"	7/8" ODM	7/8" ODM	OR	
6D75-882	III	1'-2 1/2"	1 1/8"	3/4"	1/8"	7/8"	1 1/8" ODF	1 1/8" ODF	VERT.	06D-337 06D-537

Dimensions are approximate. Certified dimension drawings are available on request.

Fig. 13 - Dimensions for 06D Muffler Assembly

**Table 1 - 07D Condensing Unit Data**

Condensing Unit	A102	A203	A103	A106		A208	A <sub>B</sub> 210	A <sub>B</sub> 112	A <sub>B</sub> 215
Compressor Model	06DA109	06DA808	06DA013	06DA718		06DA818	06DA724	06DA337	06DA537
Unit Type	WC	WC	WC	WC	WC	WC	WC	WC	WC
Nominal Tons	2	3	3	5	5	7-1/2	10	10	15
Evap Temp Level	H,M,L	H,M	H,M	H	M	H,M	H,M	H,M	H,M
No. of Cylinders	2	2	4	4	4	4	6	6	6
Bore and Stroke (in.)	2 x 1-3/8	2 x 1-1/4	1-13/16 x 1-1/4	2 x 1-7/16	2 x 1-7/16	2 x 1-7/16	2 x 1-1/4	2 x 1-15/16	2 x 1-15/16
Compr Speed (rpm)	1750	1750	1750	1750	1750	1750	1750	1750	1750
Displ at 1750 Rpm (cfm)	8.69	7.96	13.1	18.3	18.3	18.3	23.88	37.07	37.07
Suct Gas Conn. (ODF)	7/8	7/8	7/8	1-1/8	1-1/8	1-1/8	1-3/8	1-3/8	1-3/8
Disch Gas Conn. (ODF)	5/8	5/8	5/8	7/8	7/8	7/8	7/8	1-1/8	1-1/8
Liq Line Conn. (ODF)	1/2	1/2	1/2	1/2	1/2	1/2	5/8	5/8	5/8
Refrigerant	12	22	12	12	22	22	22	12	22
Optg Ref Charge (lbs)**	2	2.5	2.7	2.0	1.9	2.7	3.2	4.3	4.3
Cond Storage Cap (80% Liquid at 100 F)	18	18.5	20.5	39.5	35.8	45	67	88	88
Water Conn	Inlet	1/2 FPT	1/2 FPT (2)	1/2 FPT (2)	1/2 FPT (2)	3/4 FPT (2)	1-1/2 MPT	*1-1/2 FPT (2)	*1-1/2 FPT (2)
Cooling Tower	Outlet	1/2 FPT	3/4 MPT	3/4 MPT	1 MPT	1 MPT	*1-1/2 MPT	2 FPT	2 FPT
Water Conn	Inlet	1/2 FPT	1/2 FPT	1/2 FPT	1/2 FPT	3/4 FPT	1-1/2 MPT	1-1/2 FPT	1-1/2 FPT
City Water	Outlet	1/2 FPT	1/2 FPT	1/2 FPT	1/2 FPT	3/4 FPT	1-1/2 MPT	1-1/2 FPT	1-1/2 FPT
Frongible Discs, M. Fl.	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8

\*Remove upper header plug for parallel circuiting for cooling tower application (See Fig. 18.)

\*\*Condensing unit minimum operating refrigerant charge

WC - Water-Cooled

## INSPECT THE SITE

### Preliminary Survey

Before starting the installation, make a survey to determine the following:

### SPACE REQUIREMENTS

Dimensions for the 07D Condensing Units are given in Table 2. Allow additional room to remove the compressor heads and valve plates. Place the unit so the suction and discharge shut-off valves can be easily reached and the oil level checked.

Install the unit where it will be warmer than the refrigerated space, to prevent refrigerant from condensing in the compressor crankcase during shutdown. Water-cooled condensing units must be protected against freezing. Make provision in the piping layout to drain and blow out the condenser and water piping if the system is to be shut down in winter.

**Table 2 - Condensing Unit Dimensions**

Unit	Length (in.)	Width (in.)	Height (in.)
07DA102 WC (1 $\phi$ )	21-3/8	12	21-1/2
07DA102 WC (Poly $\phi$ )	29-1/16	12	21-1/2
07DA203 WC (1 $\phi$ )	29-1/2	12	21-7/16
07DA203 WC (Poly $\phi$ )	31-3/16	12	21-7/16
07DA103 WC (1 $\phi$ )	31-3/32	14	22-5/8
07DA103 WC (Poly $\phi$ )	32-3/4	14	22-5/8
07DA106 WC (All)	33-1/4	14	27-7/8
07DA208 WC (All)	39-5/8	14	27-7/8
07DA210 WC (All)	39-11/16	15-1/2	31-7/32
07DA112 WC (All)	46-3/8	17-7/16	32-3/4
07DA215 WC (All)	46-3/8	17-7/16	32-3/4

NOTE: WC - Water-Cooled

**Table 3 - Electrical Data for 06D Compressor Units and 07D Water-Cooled Condensing Units**

06D Compressor Unit	07D Condensing Unit	Volt/Phase Cycle	Full Load (amps)	Locked Rotor (amps)	Overload Trip (amps)	Fusetron Size (amps)	Max Kw	Min Branch Circuit Wire Size (AWG)	Max Wire Length (ft)*	Reference Old Number
	A102	208/3/60	7.9	48.5	11.0	12.0	2.8	14	49	6D21
		230/1/60	11.2	50.0	15.6	17.5	2.8	14	29	
		230/3/60	6.8	43.0	9.5	12.0	2.8	14	63	
		460/3/60	3.5	22.5	4.8	5.6	2.8	14	249	
		230/3/50	5.8	35.8	8.0	10.0	2.35	14	74	
		400/3/50	3.5	21.5	4.8	5.6	2.35	14	216	
A808	A203	208/3/60	11.8	63.5	16.5	20.0	3.8	14	32	6D28
		230/1/60	15.8	70.0	22.0	25.0	3.8	12	34	
		230/3/60	10.3	57.5	14.4	17.5	3.8	14	41	
		460/3/60	5.2	28.8	7.2	9.0	3.8	14	164	
		230/3/50	8.6	47.8	12.0	15.0	3.17	14	50	
		400/3/50	5.2	27.5	7.2	9.0	3.17	14	143	
	A103	208/3/60	12.2	63.5	17.0	20.0	4.1	14	31	6D40
		230/1/60	16.1	70.0	22.5	25.0	4.1	12	33	
		230/3/60	10.6	57.5	14.8	17.5	4.1	14	35	
		460/3/60	5.3	28.8	7.4	9.0	4.1	14	161	
		230/3/50	8.9	47.7	12.4	15.0	3.42	14	36	
		400/3/50	5.3	27.5	7.4	9.0	3.42	14	140	
A718	A106	208/3/60	19.3	95.0	27.0	30.0	6.6	10	50	6D47
		230/1/60	25.0	100.0	35.0	40.0	6.6	10	32	
		230/3/60	16.8	86.0	23.5	30.0	6.6	10	63	
		460/3/60	8.5	43.0	11.8	15.0	6.6	14	100	
		230/3/50	14.0	72.0	19.5	25.0	5.5	12	48	
		400/3/50	8.5	41.0	11.8	15.0	5.5	14	87	
A818	A208	208/3/60	35.0	137.0	48.8	60.0	10.8	6	63	6D48
		230/3/60	31.5	124.0	44.0	50.0	10.8	8	53	
		460/3/60	15.8	62.0	22.0	25.0	10.8	12	85	
		230/3/50	26.2	103.0	36.7	40.0	9.0	8	64	
		400/3/50	15.8	59.0	22.0	25.0	9.0	12	74	
	A <sub>210</sub> B	208/3/60	36.0	137.0	48.8	60.0	10.8	6	63	6D67
		230/3/60	31.5	124.0	44.0	50.0	10.8	8	53	
		460/3/60	15.8	62.0	22.0	25.0	10.8	12	85	
		230/3/50	26.2	103.0	36.7	40.0	9.0	8	64	
		400/3/50	15.8	59.0	22.0	25.0	9.0	12	75	
A <sub>824</sub> B		208/3/60	44.0	170.0	61.5	70.0	14.1	6	41	6D68
		230/3/60	39.7	153.0	55.5	70.0	14.1	6	63	
		460/3/60	19.9	77.0	27.8	35.0	14.1	10	107	
		230/3/50	33.0	128.0	46.2	50.0	11.7	6	76	
		400/3/50	19.9	74.0	27.8	35.0	11.7	10	85	
A <sub>337</sub> B	A <sub>112</sub> B	208/3/60	49.3	191.0	69.0	80.0	15.9	4	69	6D73
		230/3/60	44.3	172.0	62.0	70.0	15.9	6	57	
		460/3/60	22.2	86.0	31.0	35.0	15.9	10	96	
		230/3/50	37.2	143.0	52.0	60.0	13.2	6	67	
		400/3/50	22.2	83.0	31.0	35.0	13.2	10	83	
A <sub>537</sub> B	A <sub>215</sub> B	208/3/60	55.7	266.0	78.0	90.0	18.9	4	61	6D75
		230/3/60	50.0	240.0	70.0	80.0	18.9	4	75	
		460/3/60	25.0	120.0	35.0	40.0	18.9	8	131	
		230/3/50	41.5	200.0	58.0	70.0	15.7	6	60	
		400/3/50	25.0	115.0	35.0	40.0	15.7	8	115	

\*Wire sizes are based on minimum wire size needed to comply with National Electric Code for TW Type Wire. Maximum wire length is based on a 1% voltage drop in the

branch circuit. Where up to 3% voltage drop is acceptable, maximum wire lengths can be multiplied by 3.

### VENTILATION OF MACHINE SPACE

Ventilation must be provided to remove heat from the compressor and allow refrigerant gas to escape in case of a leak.

### VIBRATION ISOLATION

Install the unit where the floor is strong enough to support it. It is not necessary to install it on a special foundation because vibration is absorbed by the compressor mounting springs. On critical installations it may be desirable to enclose the unit in an equipment room to prevent direct transmission of sound to occupied spaces. Place the unit where it will not be damaged by traffic or flooding. It may be necessary to cage the unit.

**NOTE:** Remove the compressor hold-down bolts to allow the compressor to float freely on the springs.

### INSPECT SHIPMENT FOR LOSS AND DAMAGE

Check the shipping list immediately to see if the shipment is complete. Inspect the unit for damage. *File a claim with the shipping company immediately if damaged or lost.*

Do not remove the tags until they are read and understood. Save tags, instructions, installation record card and shipping receipt. The person starting machine may need them for reference.

### SET THE UNIT IN PLACE

Set the unit in place. Level the condenser and bolt the unit to the floor. For dimensions between hold-down bolt holes, see Fig. 6 - 13.

### CODE COMPLIANCE

Install these units in accordance with applicable codes and ordinances. Refer to ASA-B9 1-1953, American Standards Association's "Mechanical Refrigeration Safety Code."

Frangible discs are provided to protect against explosion in cases of extreme heat from an external source.

### ELECTRICAL REQUIREMENTS

Before installing the unit, check the electric service to insure that it is adequate. The voltage at the motor terminals must not vary more than plus or minus 10% of the nameplate voltage during start-up or while running.

Phase unbalance for three-phase units must not exceed 2%. Where unbalance exists, connect the two lines with the higher amperages thru the switch heater elements.

Table 3 lists the minimum wire sizes for 6D Water-Cooled Condensing Units.

Figure 14 - 16 are the unit wiring diagrams for the water-cooled condensing units.

### Water-Cooled Condensing Unit Control Transformers

Control transformers are not furnished with the 440 condensing units. Recommended transformer sizes are shown in Fig. 16. All 460/3/60 units have 115-volt control circuits. All other units have 230-volt control circuits.

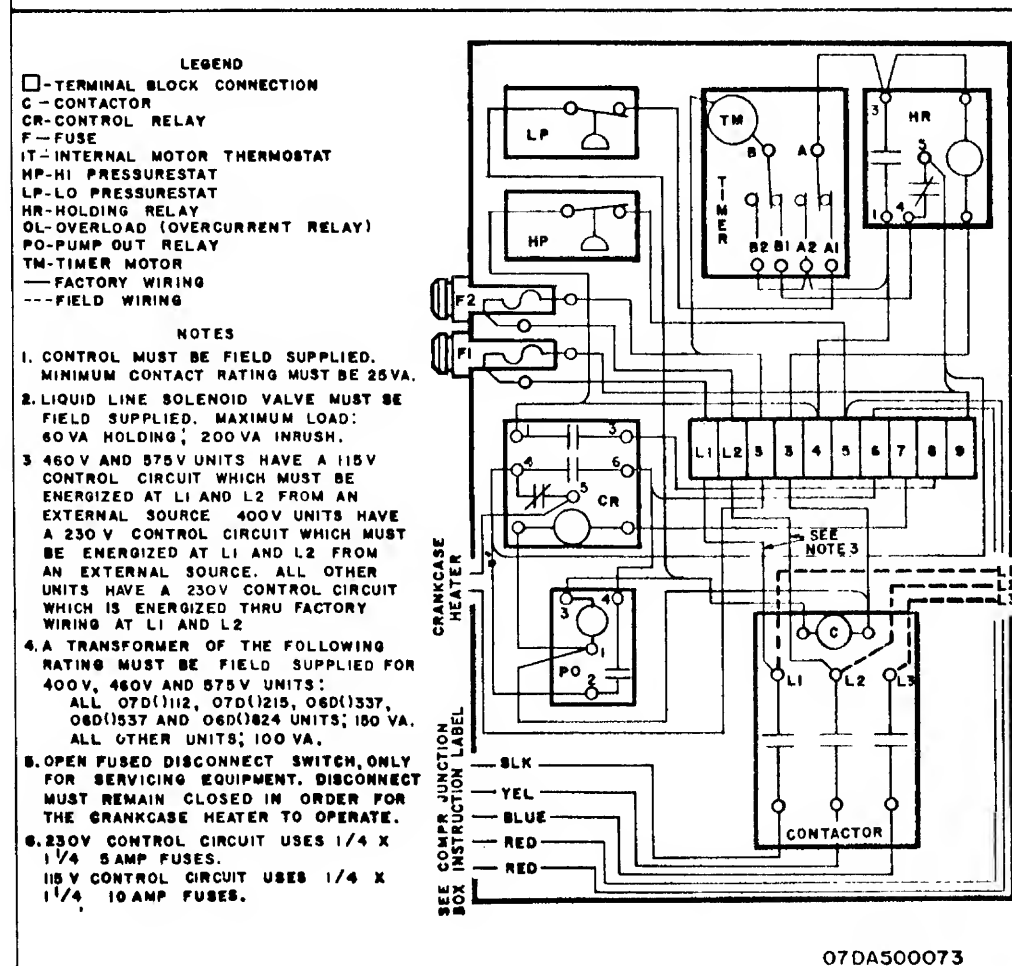
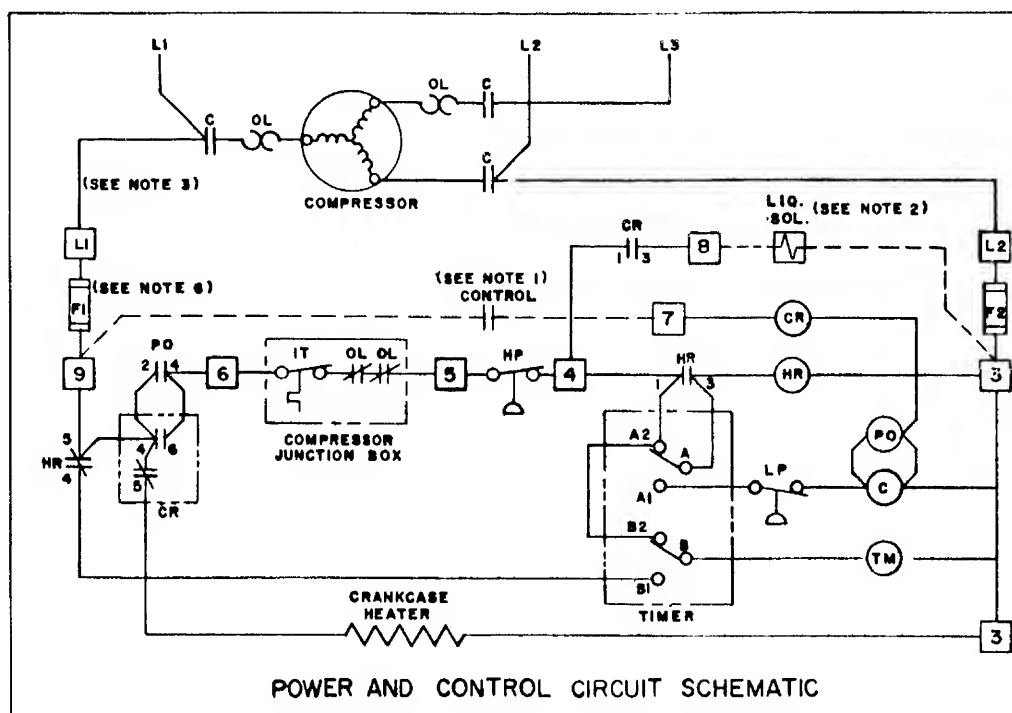
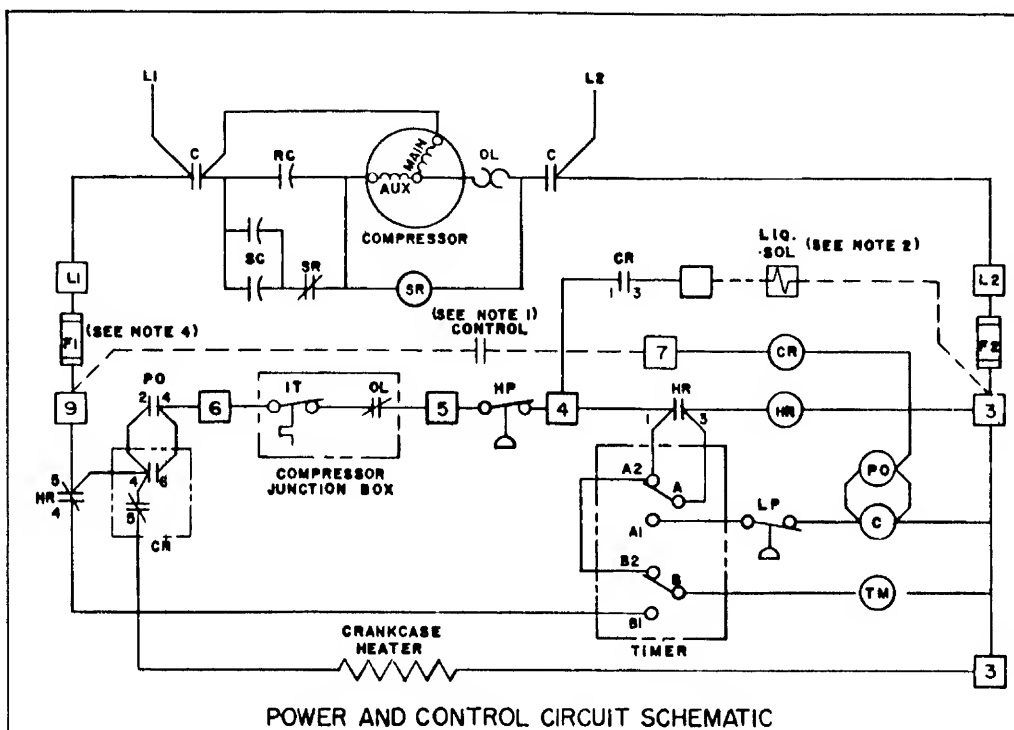


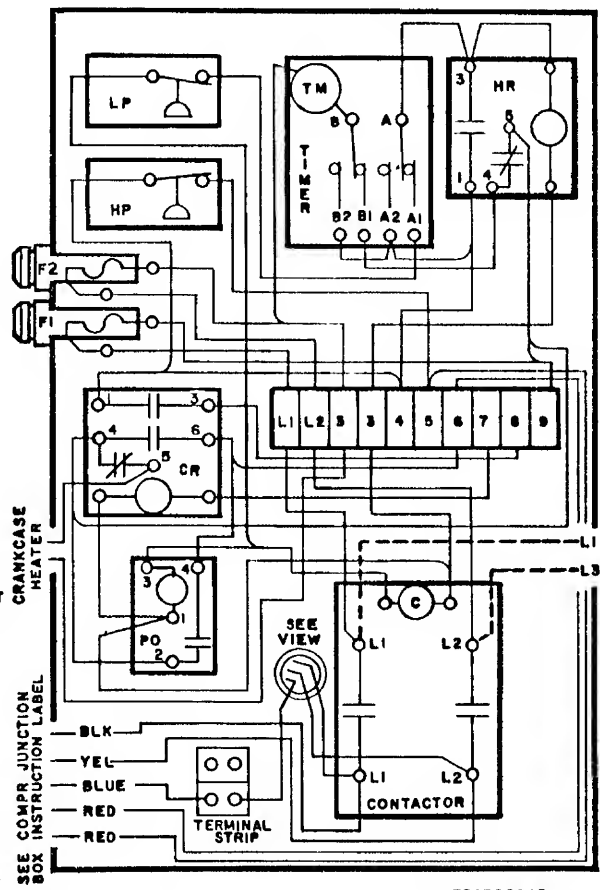
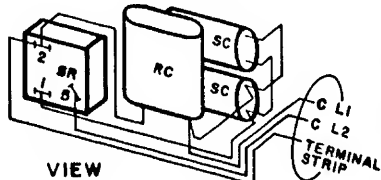
Fig. 14 - Wiring Label 07D Condensing Units, 06D Compressor Units (3-Phase)





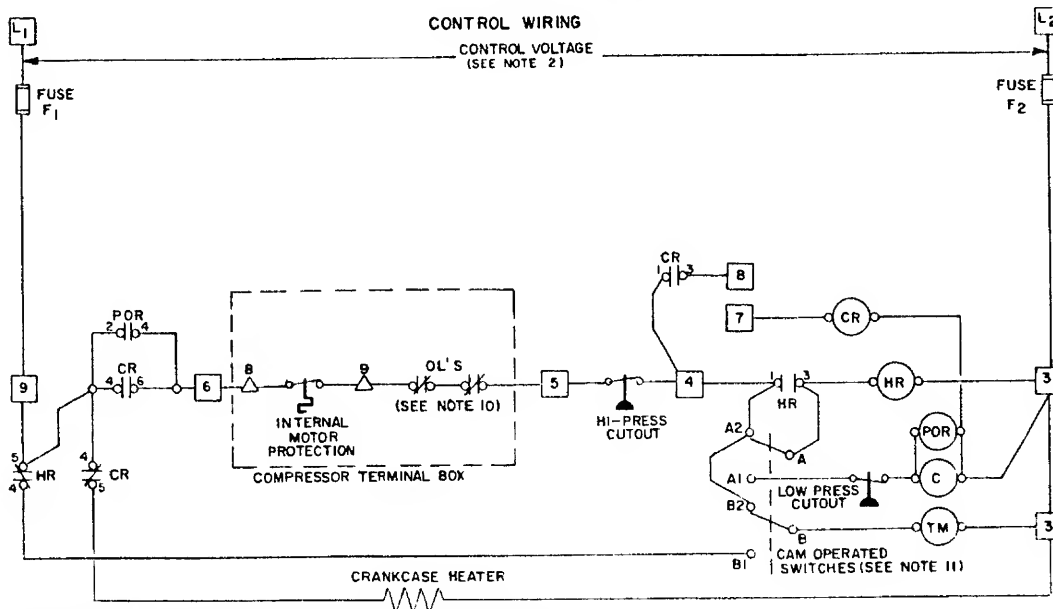
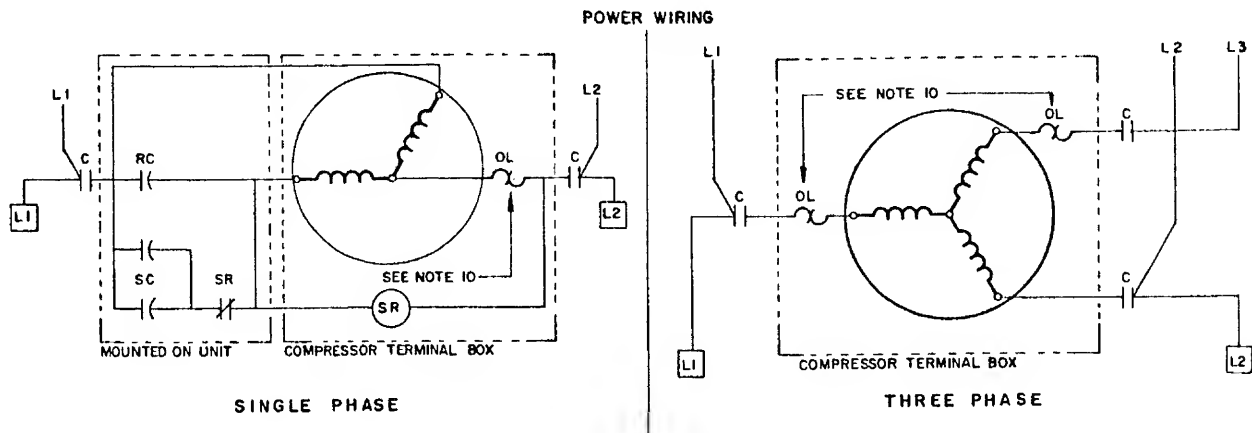
- LEGEND**
- - TERMINAL BLOCK CONNECTION
  - C - CONTACTOR
  - CR - CONTROL RELAY
  - F - FUSE
  - IT - INTERNAL MOTOR THERMOSTAT
  - HP - HI PRESSURESTAT
  - LP - LO PRESSURESTAT
  - HR - HOLDING RELAY
  - OL - OVERLOAD (OCCURRENCE RELAY)
  - PO - PUMP OUT RELAY
  - TM - TIMER MOTOR
  - FACTORY WIRING
  - FIELD WIRING
  - RC - RUN CAPACITOR
  - SC - START CAPACITOR
  - SR - STARTING RELAY

- NOTES**
1. CONTROL MUST BE FIELD SUPPLIED. MINIMUM CONTACT RATING MUST BE 25VA.
  2. LIQUID LINE SOLENOID VALVE MUST BE FIELD SUPPLIED. MAXIMUM LOAD: 60VA HOLDING; 200VA INRUSH.
  3. OPEN FUSED DISCONNECT SWITCH, ONLY FOR SERVICING EQUIPMENT. DISCONNECT MUST REMAIN CLOSED IN ORDER FOR THE CRANKCASE HEATER TO OPERATE.
  4. CONTROL CIRCUIT IS 230V AND USES 1/4 X 1/4, 5 AMP FUSES



07DA500063

Fig. 15 - Wiring Label 07D and 06D Units (1-Phase)



FACTORY WIRING IS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE ANY FIELD MODIFICATIONS OR ADDITIONS MUST BE IN COMPLIANCE WITH ALL APPLICABLE CODES.

2. 460 VOLT UNITS HAVE 115 VOLT CONTROL CIRCUIT ENERGIZED FROM EXTERNAL SOURCE. 400 VOLT UNITS HAVE 230 VOLT CONTROL CIRCUIT ENERGIZED FROM EXTERNAL SOURCE. ALL OTHER UNITS HAVE 230 VOLT CONTROL CIRCUIT ENERGIZED THRU FACTORY WIRING AT L1 AND L2.
3. CONTROL CIRCUIT POWER REQUIREMENTS: ALL 07D(1)112 & 215 & 06D(1)337, 537 & 824 WITH 400V & 460V DRAW 150 VA. ALL OTHER UNITS REQUIRE 100VA WHEN CONTROL TRANSFORMERS ARE REQUIRED THEY SHOULD BE SIZED ACCORDINGLY. THESE RATINGS APPLY TO DEVICES SHOWN ON CONTROL DIAGRAM. IF ADDITIONAL ARE USED, TRANSFORMER SIZE MUST BE INCREASED PROPORTIONATELY.
4. CONTROL CIRCUIT FUSES ARE 1/4" X 1/4" DIA CERAMIC TUBE RATED AT 5 AMPS FOR 208 & 230 VOLTS AND 10 AMPS FOR 115 VOLTS.
5. DO NOT SUBSTITUTE OVERLOAD RELAYS OF A HIGHER RATING THAN ORIGINALLY SUPPLIED.
6. IF A CONTROL VOLTAGE POWER SUPPLY HAVING A GROUND SUPPLY LEG IS USED, THE GROUND CONDUCTOR MUST BE CONNECTED TO TERMINAL 3 AND F2 BYPASSED.
7. OPEN DISCONNECT ONLY WHEN SERVICING EQUIPMENT. CRANKCASE HEATER MUST REMAIN ENERGIZED WHEN EQUIPMENT IS SHUT DOWN.
8. WIRING SHOWN IS FOR WATER-COOLED CONDENSING UNITS WITH CONTROL BOX MOUNTED. COMPRESSOR UNITS ARE SHIPPED WITH CONTROL BOX SEPARATE AND FIELD MUST SUPPLY INTERCONNECTING WIRING WHERE NECESSARY.
9. WARNING-DISCONNECT ALL CIRCUITS BEFORE SERVICING THIS EQUIPMENT.
10. ONE OVERLOAD ON SINGLE PHASE, TWO ON THREE PHASE.
11. TIMER MOTOR (TM) CAM ROTATES AT 1/5 RPM WHEN TM IS ENERGIZED TO PROVIDE 15 SEC. TIMING WITH SWITCHES IN A-A2, B-B2, POSITION AND 4 MIN. 45 SEC. IN A-A1, B-B1, POSITION. COMPLETE TIME GUARD CONTROL PROVIDES 15 SEC. ADVANCE START FOR CONDENSER AUXILIARIES AND PREVENTS COMPRESSOR RESTARTING IN LESS THAN 5 MIN. AFTER STOPPING.

#### LEGEND

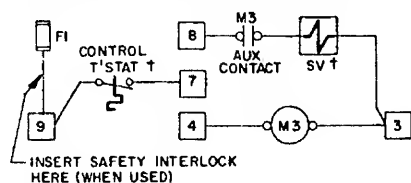
- HR HOLDING RELAY  
CR CONTROL RELAY  
C COMPRESSOR  
M3 EVAPORATOR FAN OR CHILLED WATER PUMP  
M4 COOLING TOWER PUMP, AIR COOLED OR EVAPORATIVE CONDENSER FAN  
M5 COOLING TOWER FAN OR EVAPORATIVE CONDENSER PUMP  
OL OVERLOAD  
SV LIQUID LINE SOLENOID VALVE  
SR STARTING RELAY  
US UNLOADER SOLENOID  
POR PUMP OUT RELAY  
TM TIMER MOTOR
- TERMINALS  
□ MAIN TERMINAL STRIP  
△ COMPRESSOR

MODEL NUMBERS	STANDARD ELECTRICAL * CHARACTERISTICS
07DA102	A, B, C, D, E, F
07DA203	A, B, C, D, E, F
07DA103	A, B, C, D, E, F
06DA718	A, B, C, D, E, F
07DA106	A, B, C, D, E, F
06DA818	A, C, D, E, F
07DA208	A, C, D, E, F
06D(1)824	A, C, D, E, F
07D(1)210	A, C, D, E, F
06D(1)337	A, C, D, E, F
07D(1)112	A, C, D, E, F
06D(1)537	A, C, D, E, F
07D(1)215	A, C, D, E, F

A = 208/3/60      D = 460/3/60  
\* B = 230/1/60      E = 230/3/50  
C = 230/3/60      F = 400/3/50

Fig. 16 - Field Wiring for 06D, 07D Units

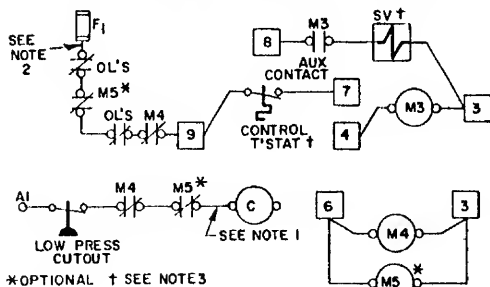
**SINGLE PUMP OUT CONTROL WITH CITY WATER**



†SEE NOTE 3

**SINGLE PUMP OUT CONTROL WITH:**

- ☐ COOLING TOWER
- ☐ COOLING TOWER FAN
- ☐ AIR COOLED CONDENSER
- ☐ EVAPORATIVE CONDENSER
- ☐ EVAPORATIVE CONDENSER PUMP

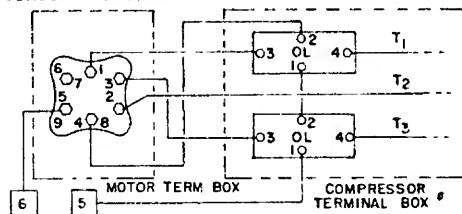


\*OPTIONAL †SEE NOTE 3

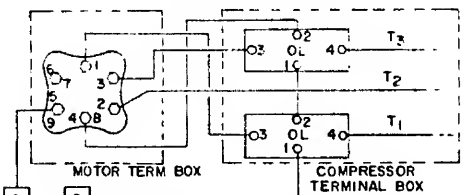
**NOTES:**

- 1 REMOVE WIRE FROM C TO LOW PRESSURE CUTOUT AND ADD NECESSARY AUXILIARY CONTACTS
- 2 REMOVE WIRE FROM FI TO [9] AND INSERT DESIRED INTERLOCKS AND OL'S
- 3 FIELD SUPPLIED T'STAT MUST HAVE MIN. CONTACT RATING OF 25VA FIELD SUPPLIED SV MAX LOAD 60VA HOLDING; 200 VA INRUSH.

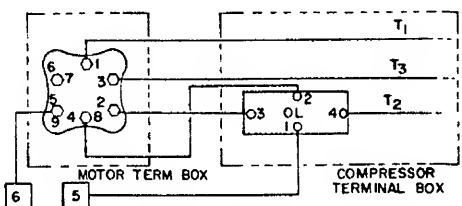
**CONDUIT TO COMPRESSOR TERMINAL BOX ARRANGEMENT**



3 PHASE - 6 CYLINDER

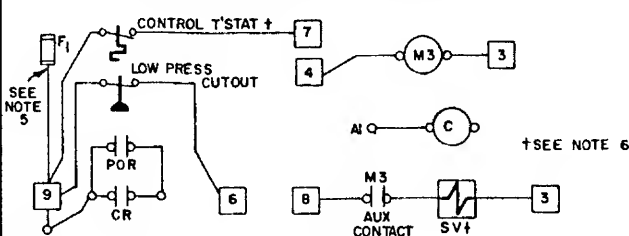


3 PHASE - 2 & 4 CYLINDER



SINGLE PHASE

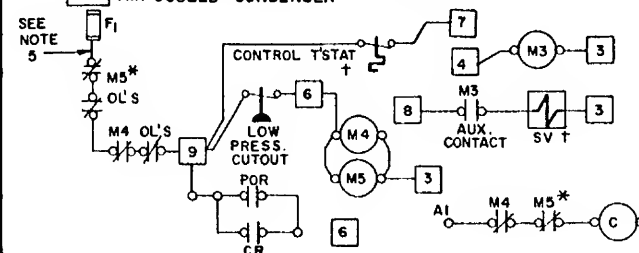
**PUMP DOWN CONTROL WITH CITY WATER (SEE NOTES NO 1 THRU 6 BELOW)**



†SEE NOTE 6

**PUMP DOWN CONTROL WITH:**

- ☐ COOLING TOWER
- ☐ COOLING TOWER FAN
- ☐ AIR COOLED CONDENSER
- ☐ EVAPORATIVE CONDENSER
- ☐ EVAPORATIVE CONDENSER PUMP



\*OPTIONAL †SEE NOTE 6

**NOTES FOR PUMP DOWN CONTROL DIAGRAMS:**

- 1 REMOVE LOW PRESSURE CUTOUT BETWEEN C & AI AND CONNECT C TO AI WITH ANY DESIRED INTERLOCKS
- 2 WIRE LOW PRESSURE SWITCH BETWEEN TERMINALS [9] & [6]
- 3 REMOVE CONNECTION BETWEEN [6] & CR NORMALLY OPEN CONTACT
- 4 DO NOT USE PUMP DOWN CONTROL METHODS FOR COMPRESSORS EQUIPPED WITH CAPACITY CONTROL USE SINGLE PUMP OUT CONTROL.
- 5 INSERT SAFETY INTERLOCKS HERE (WHEN USED)
- 6 FIELD SUPPLIED T'STAT MUST HAVE MIN. CONTACT RATING OF 25VA FIELD SUPPLIED SV MAX LOAD 60VA HOLDING; 200 VA INRUSH

**ELECTRIC UNLOADER CONTROL FOR COMPRESSORS FIELD EQUIPPED WITH ELECTRIC CYLINDER UNLOADERS (TWO SHOWN) PRESSURESTATS OR THERMOSTATS NOT FACTORY FURNISHED**

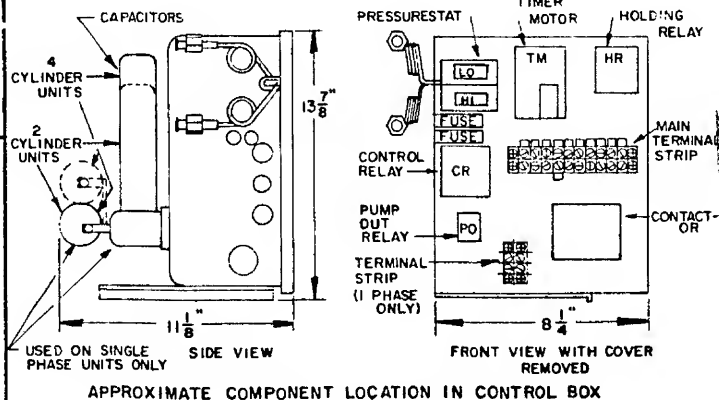
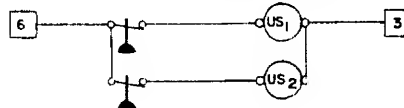


Fig. 16 - Field Wiring for 06D, 07D Units (Cont'd)

## PIPING AND ACCESSORIES

## Elimination of Pipe Vibration

The liquid and suction lines are usually of soft copper tubing. To absorb vibration, loop or sweep the liquid and suction lines near the unit. Fasten the tubing to walls or supports, using vibration isolation type hangers as shown in Fig. 17. Keep uninsulated lines away from hot water or steam lines. Follow the piping practices in Carrier System Design Manual, Part 3.

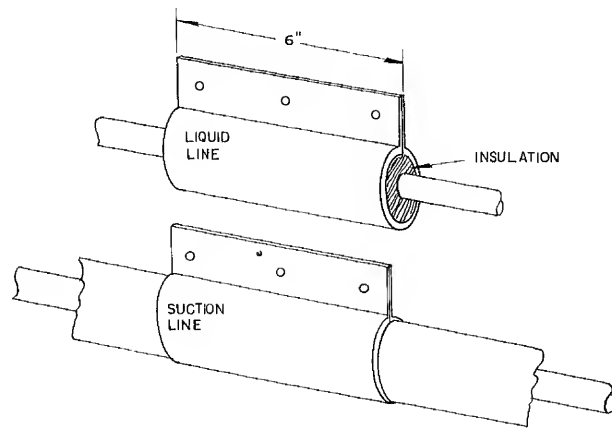


Fig. 17 - Refrigerant Line Hangers

## Time Guard Control Operation

## CONTROL CIRCUIT

This unit is equipped with controls which provide automatic reset overload protection, time delay in starting, and controlled cycling under any cycling condition. Following shutdown of the compressor for any reason (i.e., opening of the thermostat, functioning of a protective device, power failure), the control permits re-starting of the compressor only after a five

minute period has elapsed. On normal starts, the control will operate 15 seconds before starting the compressor.

The heart of the control is the cycle timer. The cam on the cycle timer completes one revolution in five minutes. Whenever the compressor is stopped the timer motor will automatically run until the cam lever is operated, which in turn actuates the necessary switches. When this sequence is completed, the cycle timer is prepared to start the unit.

Table 4 shows the normal operating sequence of the timer circuit. This table can be helpful in diagnosing electrical problems.

Operation of the control circuit is generally the same on all voltage units. However, wiring sequences for the individual controls may vary, such as overloads and safety devices.

The following is a general description of the operating sequence of the control circuit. Refer to the schematic wiring diagrams as a guide.

The functions of this control accessory are:

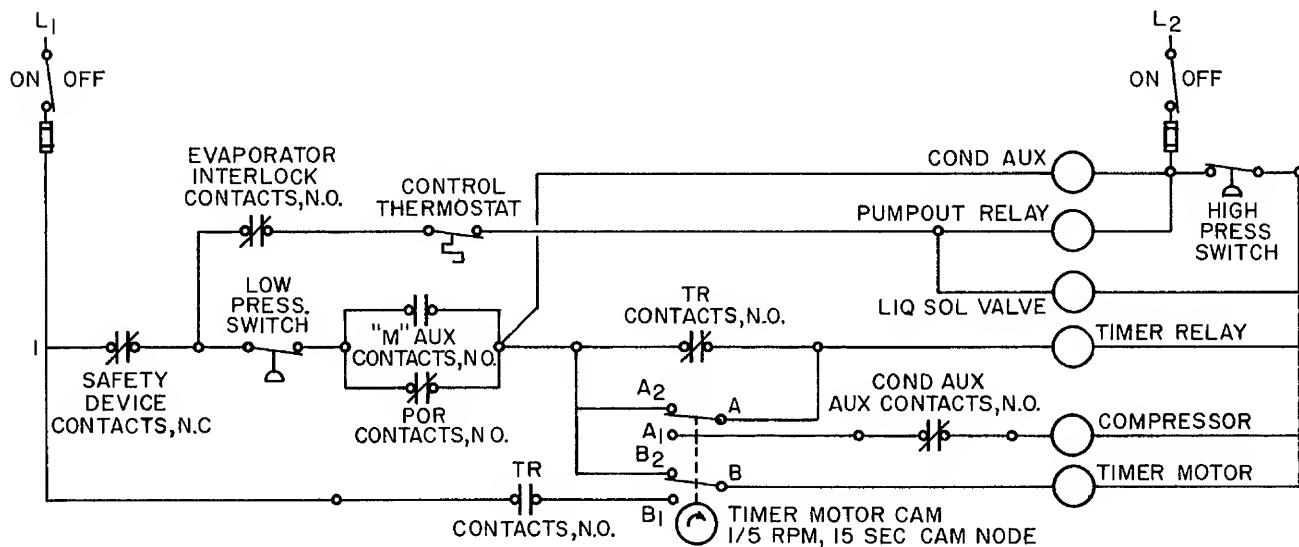
1. To limit restart cycling of the compressor, under any circumstance, to a minimum of five minute intervals after stopping.
2. To allow time to run during normal "off" periods, thus utilizing this time as part of the five minute timing interval described above in No. 1.
3. To provide a 15 second delay on each compressor start before the compressor motor starter is energized; to allow auxiliaries such as condenser pump, condenser fan, chilled water pump, etc. to be in operation before the compressor starts. This feature will prevent nuisance cutouts due to momentary action of the high pressure switch or chilled water flow switch during start-up.

Table 4 - Recycling Control Circuit Normal Operation Chart

Control	Voltage	Unit at Rest Ready to Start	Thermostat Closes Instantaneous thru 15 Seconds	Normal Run	Thermostat or Safety Device Opens—Instant Thru 4-3/4 Min	Unit Ready to Restart
<b>Timer Relay</b>						
Coil	230	DE	EN	EN	DE	DE
Contacts N.O.	230	OP	CL	CL	OP	OP
Contacts N.C.	230	CL	OP	OP	CL	CL
<b>Cycle Timer</b>						
Motor	230	DE	EN	DE	EN	DE
Cam		Up	Up	Down	Down	Up
Contacts A-A2	230	CL	CL	OP	OP	CL
Contacts A-A1	230	OP	OP	CL	CL	OP
Contacts B-B2	230	CL	CL	OP	OP	CL
Contacts B-B1	230	OP	OP	CL	CL	OP
<b>Compressor</b>	Line	DE	DE	EN	DE	DE
<b>Accessories</b>	230	DE	EN	EN	DE*	DE

Legend: EN - Energized  
CL - Contacts Closed and in Service  
OP - Contacts Open  
DE - De-energized

\*Accessories will continue to run if high or low pressurestat shuts off compressor.



1. **Starting Sequence** (Assuming evaporator interlocks and all operating safety controls are in closed position)

**Time:** 0 Min 0 Sec - Timer switch plunger is up at beginning edge of cam node and contacts are in positions A-A2 and B-B2, as shown.\*

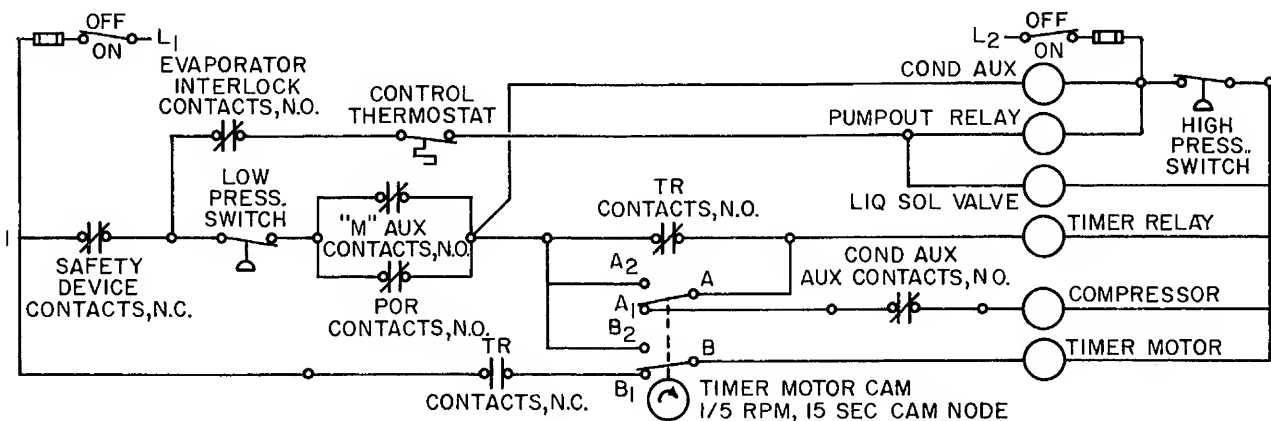
Control thermostat closes, energizing liquid line solenoid valve (SV) and pump-out relay (POR). POR N.O. contacts close. Re-

frigerant pressure rises and low-pressure switch closes.

Condenser auxiliaries, such as condenser water pump, tower fan, etc., start and their auxiliary starter contacts close. Timer relay (TR) is energized thru timer switch contacts A-A2, closing TR N.O. contacts and opening TR N.C. contacts. Timer motor (TM) is energized thru timer switch contacts B-B2 and starts running.

\* This is the position always reached by the cam each time after the compressor has stopped and the timer motor has completed its 4 min and 45 sec timing run.

**Starting Sequence of Time Guard Control (Single Pump-Out Arrangement Shown)**



## 2. Operating Condition

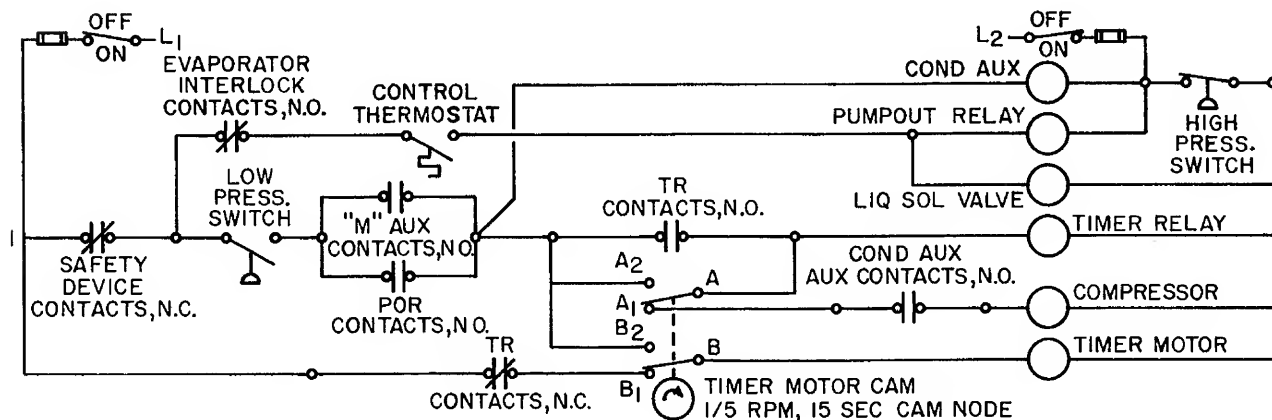
Time: 0 Min 15 Sec

Timer switch plunger has dropped off the cam node and the contacts have switched to positions A-A<sub>1</sub> and B-B<sub>1</sub>. Timer motor stops running since TR N.C. contacts are open.

Timer relay (TR) remains energized thru TR N.O. contacts, which are now closed.

Compressor motor starter is energized thru timer switch contacts A-A<sub>1</sub> and compressor starts. Compressor continues to run unless circuit is broken by action of control thermostat or safety devices.

### Operating Condition of Time Guard Control (Single Pump-Out Arrangement Shown)



## 3. Stopping Sequence

Time: Any time after 15 seconds

Timer switch plunger is still in position of having just dropped off the cam node, since timer motor has not been running, and switch contacts are in position A-A<sub>1</sub> and B-B<sub>1</sub>.

Thermostat opens when cooling load is satisfied. Liquid solenoid valve (SV) is de-energized and closes. Pumpout relay (POR) is de-energized, and its contacts open. The timer relay (TR) and compressor continue to operate thru compressor starter auxiliary contacts "M" until system pumps down and low-pressure switch opens. Then compres-

sor and condenser auxiliaries stop and relay TR is de-energized. TR N.C. contacts close and timer motor (TM) is energized thru switch contacts B-B<sub>1</sub> and starts to run.

The TM timer will switch again to position A-A<sub>2</sub> and B-B<sub>2</sub> after 4 min 45 sec elapse.

Thus, at least 4 min 45 sec must elapse after a shutdown before the compressor can begin its restart sequence, if the cooling thermostat is closed. A total of 5 min will elapse before the compressor can restart. Each compressor restart is preceded by 15 sec operation of the condensing equipment.

This reverts to conditions at time 0 min 0 sec.

### Stopping Sequence of Time Guard Control (Single Pump-Out Arrangement Shown)

### Shut-Off Valves

The suction and discharge shut-off valves are of the backseating type and have gage ports. Frontseating the valve closes the refrigerant line and opens the gage port to the pressure in the compressor.

Backseating the valve shuts off pressure to the gage port. To attach a gage or charging line to the gage port, backseat the valve to prevent escape of refrigerant.

Use a square ratchet or box-end wrench to open or close a valve. Do not use pliers or an adjustable wrench. They are likely to round the valve stem.

Do not use excessive force to turn the stem. If it turns hard, loosen the packing gland nut. If the valve sticks on its seat, a sharp rap on the wrench will usually break it loose.

### Crankcase Heater

The crankcase heater is an internal cartridge-type heater that is inserted in a blind hole in the compressor bottom cover. It does not come in direct contact with the oil. The heater draws 75 watts and is held in the hole by a clip. Insure that the crankcase is held tightly in place by the clip.

The heater is approved for wet locations.

The crankcase heater should be energized at least 12 hours before start-up to insure that the refrigerant is out of the oil.

### Liquid Line Solenoid Valve (Field Supplied)

The purpose of this valve is to prevent damage to the compressor which would result from flooding of the crankcase with refrigerant during shutdown and to provide the pumpdown control feature. Install this valve in the liquid refrigerant line directly ahead of the expansion valve. It must be installed in the vertical position and wired as shown in the wiring diagrams.

### Liquid Line Sight Glass

Install the liquid line sight glass between the liquid line solenoid and expansion valve. Locate the sight glass so that it is convenient to place a light behind the glass when observing the liquid for proper charge.

### Liquid Line Strainer-Drier

Install the liquid line strainer-drier in the liquid refrigerant line. The drier should be installed between the sight glass and the solenoid valve.

### Flare Connections

Using too much force in tightening flare nuts will damage the copper flare. Repeated tightening will harden the copper. To soften copper tubing, heat it to a dull red and allow it to cool.

### Soldering and Brazing Piping to Valves

Disassemble the valve or wrap it in wet cloth to prevent damage by heat.

### Water Regulating Valves (Water-Cooled Units Only)

Install the water regulating valve with the capillary down and the arrow on the valve body in the direction of water flow.

1. Backseat the liquid line shut-off valve.
2. Connect the capillary of the water regulating valve to the 1/4 inch flare connection on the liquid line shut-off valve.
3. Open the shut-off valve one turn from the backseated position. This allows refrigerant pressure to reach the water regulating valve and still leave the refrigerant line open.

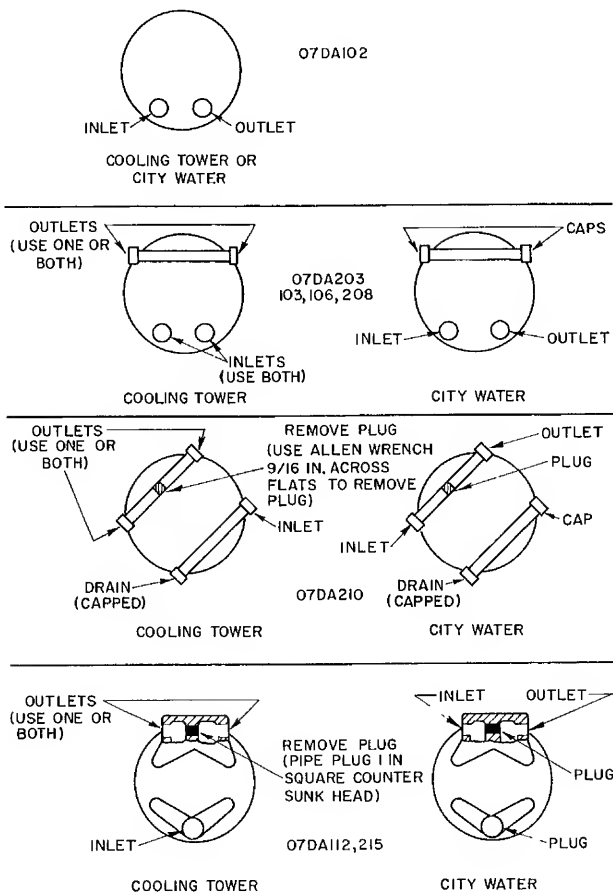
**NOTE:** The water regulating valves for R-12 and R-22 are not interchangeable.

### Condenser Water Connections

When city water is used for condensing, the condenser circuits are normally connected in series.

When cooling tower water is used for condensing, the condenser circuits are normally connected in parallel. (See Fig. 18 for correct connections.)

**IMPORTANT:** In the case of the 07DA210, 112, 215 WC Condensers, a plug in the upper header must be removed to provide parallel circuiting for cooling tower application. This plug is accessible by removing the upper header cap and unscrewing the Allen pipe plug. (See Fig. 18 for proper wrench sizes.)



**Fig. 18 - Water-Cooled Condensing Units Condenser Water Connections**

## LEAK TEST THE SYSTEM

1. Charge the system to 40 psi with dry nitrogen or carbon dioxide. Check all joints for large leaks with soap solution.
2. Release the pressure and charge to 10 psi with refrigerant.
3. Add dry nitrogen or carbon dioxide until the pressure is 150 psi.
4. Check for leaks with a halide leak detector.
5. Repair leaks and purge system.

**PRECAUTIONS:** Do not use the compressor to build up pressure. If used to compress air, overheating and damage may result.

**DO NOT USE OXYGEN TO BUILD UP PRESSURE.** Use a refrigerant or a dry stable gas such as nitrogen or carbon dioxide instead.

## The Halide Leak Detector

The halide leak detector in Fig. 19 consists of a burner, needle valve, suction tube, and a chimney with a copper reaction plate. Some torches use alcohol and others propane as fuel.

### To use the leak detector:

1. Adjust the flame so the top of the flame cone is level with or slightly above the chimney.
2. Place the end of the suction tube at the point to be tested. The tube pulls in a sample of air to the burner where the refrigerant is decomposed by reaction with the copper plate.
3. Observe color of the flame. Small leaks give a greenish tint and large ones a vivid blue.



**Fig. 19 - Halide Leak Detector**

## DEHYDRATE THE SYSTEM

### Preparation

Moisture in the system causes oil sludge and corrosion. It is likely to freeze up the expansion valve of a low temperature system. The best means of dehydration is evacuation with a pump especially built for this purpose.



Before dehydrating a system make the following preparations:

1. Obtain a pump that will produce a vacuum of 0.2 in. Hg absolute. Do not use the compressor as a vacuum pump. It is not designed for such use and may be seriously damaged.
2. Pressure test the system to be sure it is free of leaks.
3. Obtain a vacuum indicator similar to that shown in Fig. 20 (available from Robinair Manufacturing Corporation, Edgerton, Ohio).
4. Keep the ambient temperature above 60 F to speed the evaporation of moisture.

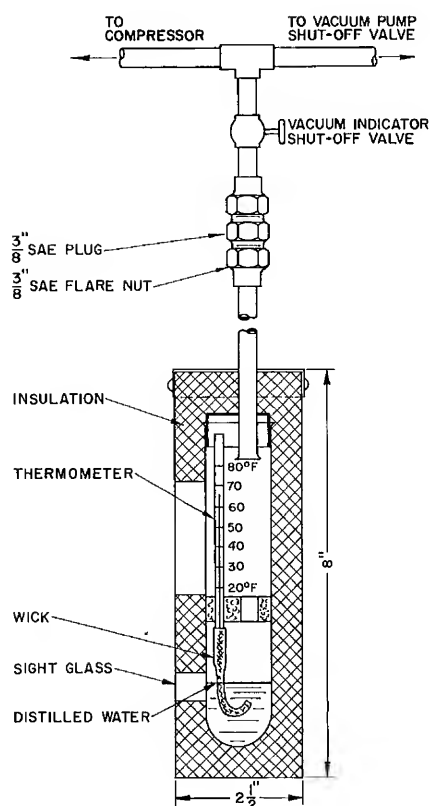


Fig. 20 - Vacuum Indicator

## Description and Use of the Vacuum Indicator

The vacuum indicator consists of a wet-bulb thermometer in an insulated glass tube containing distilled water. Part of the tube is exposed so the thermometer can be read and the water level checked. When the vacuum indicator is connected to the vacuum pump suction line, the thermometer reads the temperature of the

water in the tube. The temperature is related to the absolute pressure in the tube. Table 5 gives the absolute pressures corresponding to various temperatures.

Table 5 - Vapor Pressures of Water

Temp F Observed on Vacuum Indicator	Absolute Pressure Inches of Mercury
70	0.739
60	0.522
55	0.436
50	0.363
45	0.300
40	0.248
35	0.204
32	0.180

### NOTE:

To determine the vacuum in inches of mercury, subtract the absolute pressure from the barometer reading.

Handle the vacuum indicator with care. It must be vacuum tight to give a true reading. The top seal of the indicator is not designed to support a long run of connecting tubes. Fasten the tubes to supports to prevent damage.

Use only distilled water in the indicator. Be sure the wick is clean. Oil or dirt on the wick causes erroneous readings.

To prevent loss of oil from the vacuum pump and contamination of the indicator:

1. Install a shut-off valve in the suction line at the vacuum pump.
2. Install a shut-off valve in the suction line at the vacuum indicator (Fig. 20).
3. When shutting off the pump, close the indicator valve and the pump valve, and turn off the pump in that sequence.

## Procedure for Dehydrating the System

1. Connect the pump and vacuum indicator to the system. Put a "jumper" line between the high and low side so that the pump will draw a vacuum on all portions of the system. Open the compressor shut-off valves. Start the pump.
2. Open the indicator connection shut-off valve occasionally and take a reading. Keep the

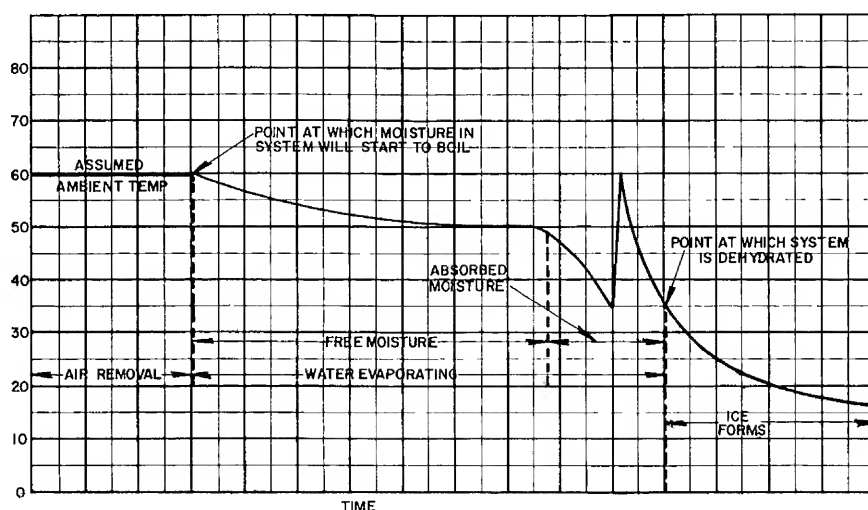


Fig. 21 - Dehydration Pull-Down Curve

valve open at least three minutes for each reading. (Keep the valve closed at all other times to decrease the amount of water the pump must handle and hasten dehydration.) When the pressure in the system drops to a value corresponding to the vapor pressure of the water in the indicator, the temperature will start to drop. In the example shown in Fig. 21, the ambient temperature and the temperature of the water in the indicator is 60 F. Starting at 60 F and 0 time, the temperature of the water in the indicator remains at 60 F until the pressure in the system is pulled down to the pressure corresponding to the saturation temperature of the water (60 F). At this point the moisture in the system will start to boil. The temperature drops slowly until the free moisture is removed, and then more rapidly until the absorbed moisture is removed (35 F). Dehydration is nearly completed at this point, provided the ambient temperature remains at 60 F or higher. If the ambient temperature were lower than 60 F, ice might form before moisture removal is complete.

3. Continue the dehydrating operation until the vacuum indicator shows a reading of 35 F which corresponds to a pressure of 0.204 in. Hg absolute. This may take several hours. It may be advantageous to run the pump all night.
4. With the pump still running, open the system at a point farthest from the pump and admit air thru a drier. Close system and repeat Steps 2 and 3. Vapor in the system is thus greatly diluted and almost completely removed by double dehydration.

5. After evacuation, turn off the pump suction valve and break the vacuum by admitting refrigerant.

6. Disconnect the pump and vacuum indicator.

### CHECK REFRIGERANT CHARGE

After the system has been evacuated and dehydrated, charge refrigerant in gas form into the low side as follows:

1. Backseat the suction and discharge shut-off valves. Install a gage in the discharge gage port and turn the valve one turn from the backseat position to allow pressure to reach the gage.
2. Connect a refrigerant drum thru a drier and tee connection with a compound gage, to the suction gage port. Purge air from the lines and tighten the connections.
3. Turn the suction shut-off valve a couple turns from the backseat position and open the refrigerant drum valve. Keep the refrigerant drum in an upright position to prevent liquid refrigerant from entering the compressor.
4. Start the compressor. See "INITIAL START-UP INSTRUCTIONS."
5. Check the refrigerant charge frequently while charging, by observing the liquid line sight glass. The refrigerant charge is sufficient when flashing (bubbles) disappears. An alternate method of checking the charge is to

crack open the liquid test cock. The charge is sufficient if a mixture of liquid and vapor comes from the test cock.

The sight glass method of checking the refrigerant charge is more reliable, and should be used whenever possible.

- When the system is sufficiently charged, close the valve to the refrigerant cylinder, back-seat the suction shut-off valve, disconnect the charging line, plug the gage ports, and recap the valve stems. If the pressure in the cylinder drops to the level of the suction pressure, all refrigerant can be drawn from the cylinder by frontseating the suction shut-off valve and pulling a vacuum on the cylinder.

**CAUTION:** Be careful not to overcharge the system. Overcharging results in:

- Higher discharge pressure due to excess liquid in the condenser. With water-cooled units this means higher cooling water consumption.
- Possible compressor damage.
- Higher power consumption.
- Increased flooding of refrigerant to the compressor during off-cycle if the expansion valve is leaky.

To charge the system thru the liquid line, refer to the Service Section of the Product Information Book.

### INITIAL START-UP INSTRUCTIONS

The compressor should be started up only by a refrigeration mechanic who is familiar with accepted operation practices for refrigeration systems. Detailed instructions for checking and adjusting the components will be found under "CHECKING OPERATIONS."

Proceed as follows:

#### Water-Cooled Units

- Check to see that the proper oil level appears in the compressor sight glass. (A dipstick must be used with two cylinder compressors.) See "Lubrication" under "CHECKING OPERATIONS."
- Open the main water supply valve and allow water to reach the condenser.

- Open the compressor discharge and suction shut-off valves.
- Open the liquid line valve at the receiver.
- Open pressure line valve of the water regulating valve.
- Close the main power switch supplying current to the compressor starter.
- Check the oil pressure. (See "Lubrication.")
- Adjust the water regulating valve.
- Check control settings.
- Recheck the oil level in the crankcase.
- Cap all valves tightly.

### CHECKING OPERATIONS

When starting a newly installed compressor, be on the alert for any sign of trouble. Always install suction and discharge pressure gages. The water regulating valve on water-cooled units may need adjustment.

#### Dual Pressurestat

A dual pressurestat is connected to both the high side and low side to protect the compressor. Settings are preset at the factory for use with R-12 or R-22 as shown by the values in Table 6.

Table 6 - Factory Pressurestat Settings (Psig)

Unit	High Pressure		Low Pressure	
	Cutout	Cut-in	Cutout	Cut-in
07D Units	280	200	36	67
06D Units	370	290	36	67

The 07D condensing unit high pressurestat cut-out point is adjustable from 230-340 psig with a fixed differential. The 06D compressor unit high pressurestat cutout point is adjustable from 230-400 psig with a fixed differential. The low pressurestat on all units have an adjustable cut-out from 20" vacuum to 70 psig and an adjustable differential from 13-50 psi. All adjustments are made thru the back of the control box.

Check the high-pressure cutout by throttling the condenser water on water-cooled units, or

blocking the air flow on air-cooled units, allowing the head pressure to rise gradually. The cutout and cut-in pressures should be within 10- to 15-pounds of the values shown in Table 6. If they are not, the pressurestat should be replaced or adjusted if it is an adjustable type. Check the low-pressure cutout by closing the suction shut-off valve or by closing the liquid line shut-off valve to allow the compressor to pump down. The cut-in and cutout points may be adjusted if necessary.

### Lubrication

A properly adjusted compressor should run with the crankcase warm to the touch. Check oil level frequently to see that a sufficient amount of oil remains in the crankcase. Check the oil pressure by looking thru the crankcase sight glass at the oil pressure relief valve. (For 2 cylinder compressors, see Fig. 22.) If oil is discharged from the relief valve, pressure is adequate.

To check the oil charge on 2 cylinder 6D compressors, proceed as follows:

1. Pump down the compressor, turn off power and close the shut-off valves.
2. Remove the suction manifold pressurestat connection and half-union coupling.
3. Insert a dipstick in the hole and measure the oil charge.

Below is a sketch of a simple dipstick that may be used on 2 cylinder 6D compressors.

### Factory Oil Charge

The unit compressors are shipped with the oil charges of PP33-2 oil shown in Table 7. Do not assume that the charge is sufficient. Run the unit for 15- to 20-minutes until conditions have leveled off. Stop the compressor without pumping down and immediately check the oil level. The oil level must be 1/3 to 2/3 of the way up on the sight glass. If the oil level is low, add oil.

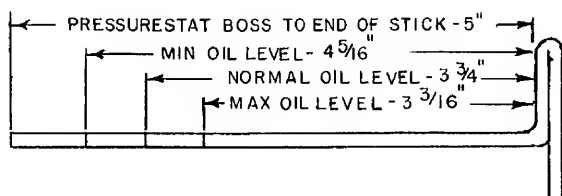


Fig. 22 - Oil Level Measurement 2 Cylinder Compressors

Table 7 - Factory Oil Charge (Pts)

Compressor	Oil Charge
06DA109	3-1/2
06DA808	3-1/2
06DA013	5
06DA718	7
06DA518	7
06DA724	10
06DA337	10
06DA537	10

### ADDING OIL

1. Pump down the compressor to 2-psi gage; stop the compressor and close shut-off valves.
2. Add oil thru the low-side pressurestat connection or the oil fill plug on 6 cylinder compressors.

**NOTE:** Be sure to connect the low-side equipment and to size the piping, so oil will return to the compressor under all operating conditions.

### Water Valve Adjustment (Water-Cooled Units Only)

Adjust the water regulating valve to the most economical head pressure for the locality. Normally this is between 120- and 140-psi for R-12 and between 200- and 230-psi for R-22.

### 07DA210,112,215 ELECTRICALLY OPERATED CAPACITY CONTROL DEVICE

The Capacity Control Device is a cylinder head bypass type, solenoid operated. Energizing the control solenoid unloads a complete cylinder bank and de-energizing the solenoid loads a complete cylinder bank.

Controls to operate the solenoid valve are not furnished with the 07DA210,112,215 condensing units. They must be field furnished and may be either temperature or pressure operated as per job requirements.

### Solenoid Valve Electrical Characteristics

208/220 volts	1 $\phi$	60 cycle	10.4 VA holding	41.6 VA inrush
220 volts	1 $\phi$	50 cycle	10.4 VA holding	41.6 VA inrush
115 volts	1 $\phi$	60 cycle	10.4 VA holding	41.6 VA inrush

The control solenoids will be field wired to the condensing unit control box (Fig. 16). All wiring must comply with local codes.

Figures 23 and 24 explain the operating sequence of the 07DA210,112,215 Capacity Control Device.

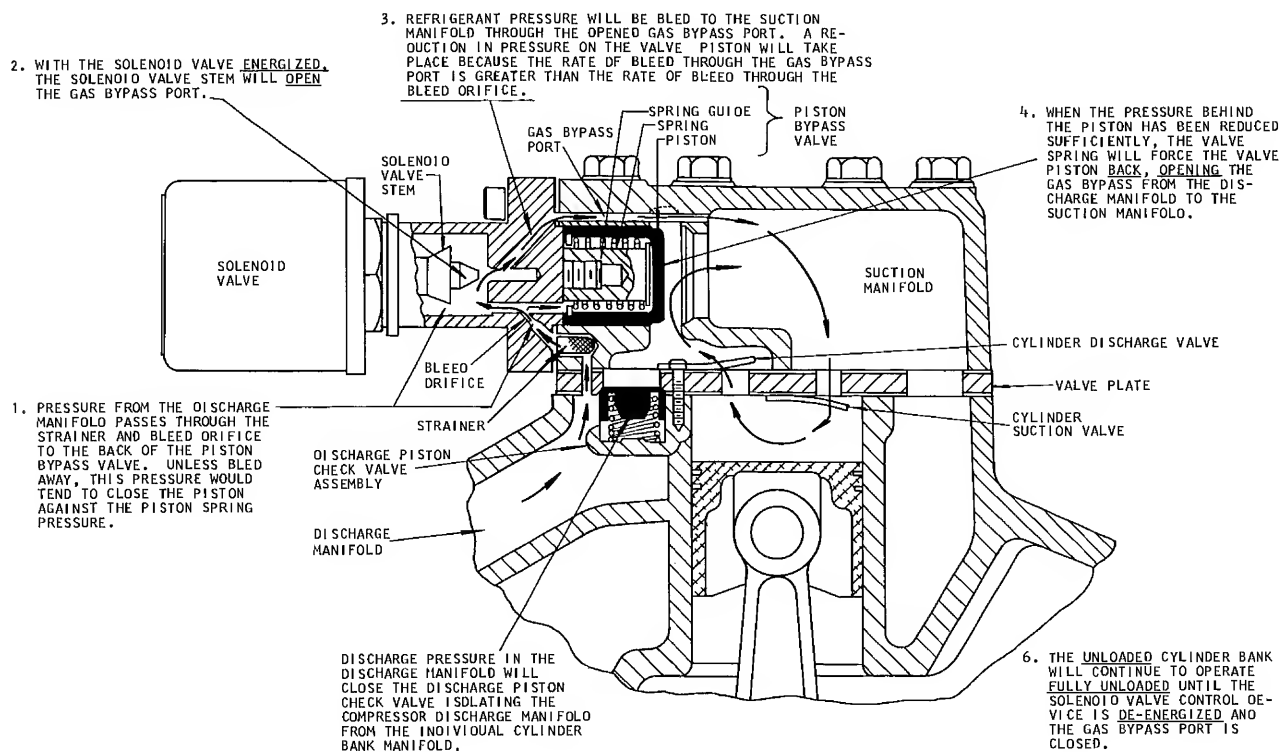


Fig. 23 - 07DA210,112,215 Compressor with Cylinder Head Unloading - Cylinder Bank Unloaded

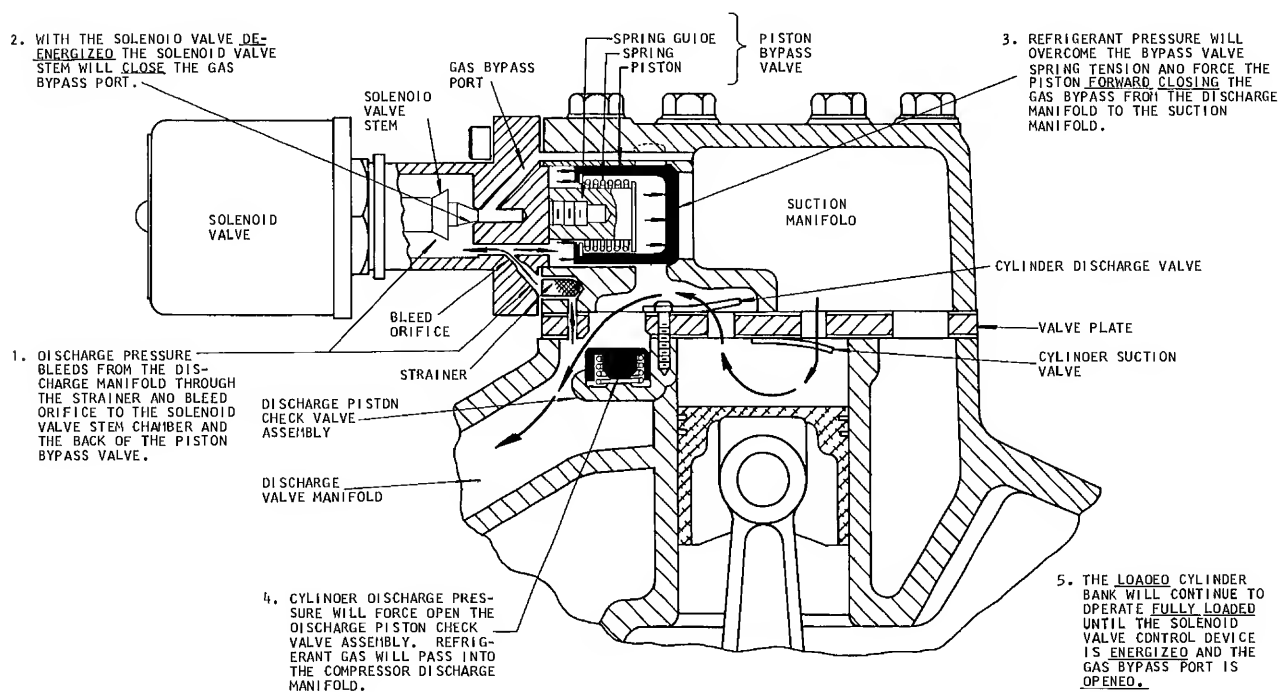
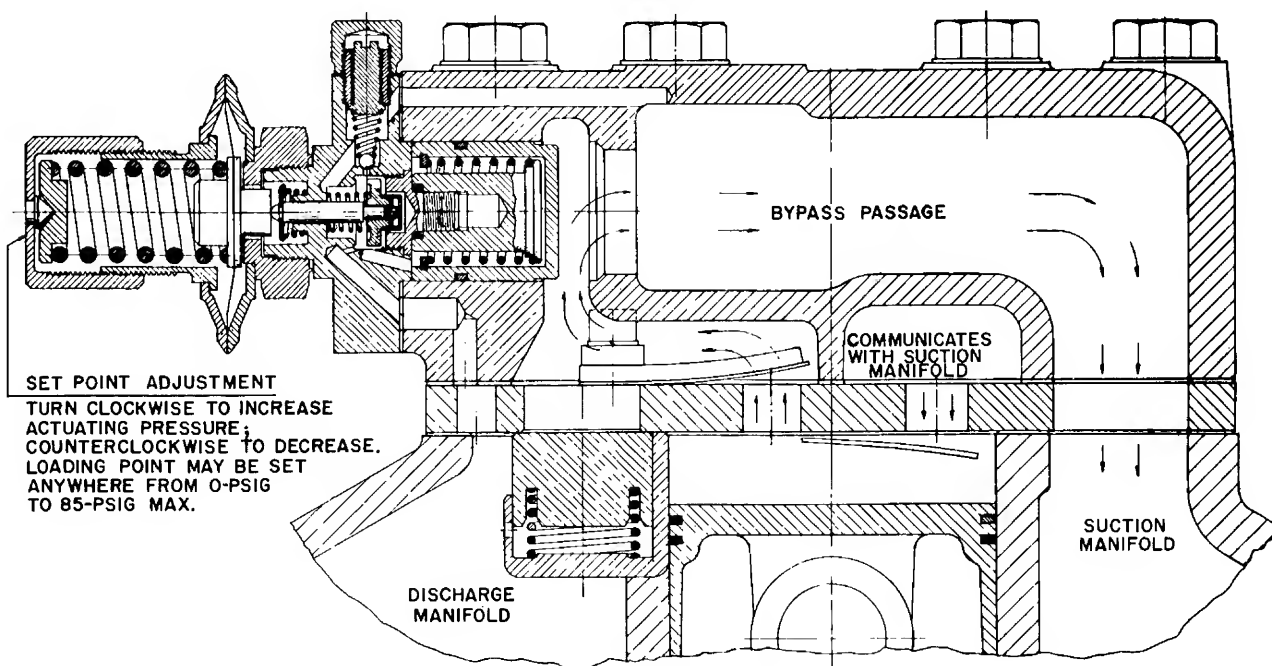
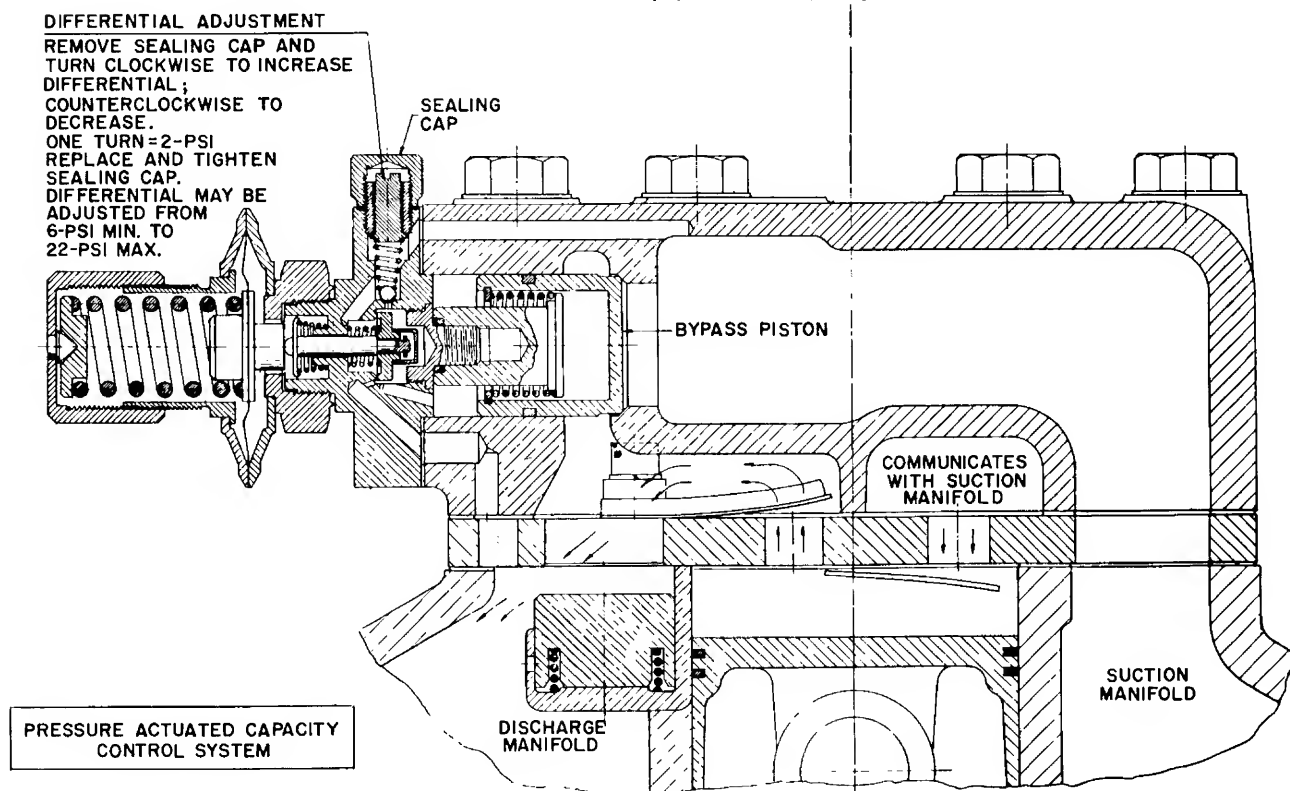


Fig. 24 - 07DA210,112,215 Compressor with Cylinder Head Unloading - Cylinder Bank Loaded



(A) UNLOADED OPERATION



(B) LOADED OPERATION

Fig. 25 - Pressure Actuated Capacity Control System - 06D Compressors

### Pressure Operated Capacity Control Valve Operation

This valve is self-contained in that no wiring or external controls such as pressurestats or thermostats are needed as on the solenoid capacity control valve.

This valve is interchangeable with the solenoid capacity control valve now used on the 6D compressors.

It is also interchangeable between the 06D and 06E compressors.

This valve is a self-actuated cylinder head bypass type which is suction pressure operated. The valve operation is such that the controlled cylinders will not load up until a differential of 25 psi between suction and discharge pressure is established.

There can be a control valve in each side bank of the six cylinder compressors. Each of the control valves will load or unload two cylinders in a single bank of the compressor by allowing the discharge gas to bypass to the suction side thru the bypass port. The unloaded cylinders then operate thru no pressure differential, thus consuming very little power.

When the suction pressure drops due to decrease in load, the poppet valve will snap open, as shown in Fig. 25A. The discharge gas behind the piston will now bleed out to the suction manifold, reducing the pressure behind the bypass piston and allowing the bypass piston spring to pull the piston back against the valve body. The bypass piston port will then open allowing discharge gas to recirculate back to the suction manifold.

When the suction pressure is above the valve set point, the poppet valve will be closed, as shown in Fig. 25B. Discharge gas will now bleed into the valve chamber. The pressure will then overcome the bypass valve spring tension and force the piston forward, sealing the bypass port. The two cylinders controlled by this valve will now run fully loaded.

The check valve in the valve plate will close when the cylinder bank is unloaded, isolating the individual cylinder bank from the discharge manifold. When the bank loads up, the discharge gas pressure will force open the check valve, allowing the gas to pass into the discharge manifold.

Pumpdown control is NOT recommended when using these valves because of a bleed in the differential chamber. This device will equalize

the compressor upon shutdown within 50 psi differential very quickly so that on start-up the compressor will have very little head pressure to start against. There is a possibility of short cycling on pumpdown because of a short equalization time. Therefore, we recommend single pumpout or liquid line solenoid drop with crank-case heaters.

The control load up or set point (Fig. 26) is adjustable from -40 F (0-psig) to +50 F (85-psig) and is set in the field for individual job requirements. The set point adjustment is made by turning clockwise to increase the control pressure (load up) and counterclockwise to decrease the control pressure point.

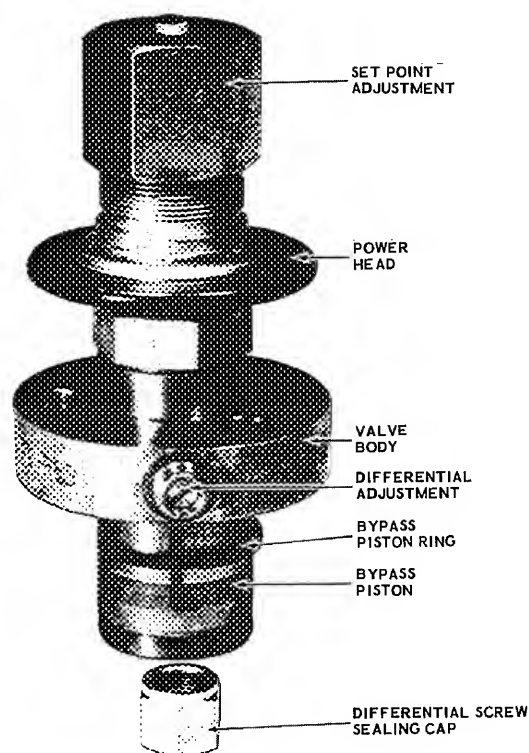


Fig. 26 - Capacity Control Valve

To Adjust - The set point head should be turned clockwise down to the bottom stop. The counterclockwise turns can be determined by using the curve in Fig. 27. If the desired load up point is known, the number of turns can be picked off the curve.

The differential adjustment (Fig. 26) will vary the pressure difference between the cut-in and cutout point from 6- to 22-psi. This differential adjustment is made by removing the sealing cap and turning the inside screw clockwise to increase the differential and counterclockwise to decrease the differential.

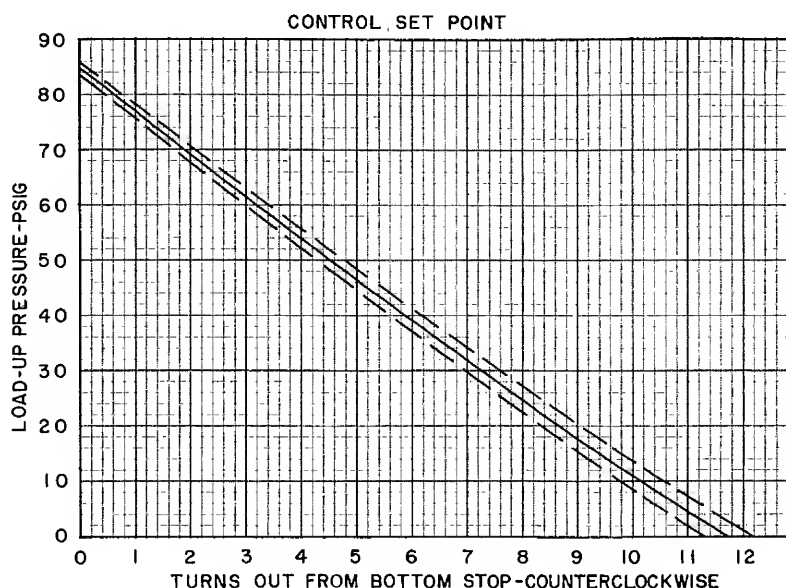


Fig. 27 - Control Set Point

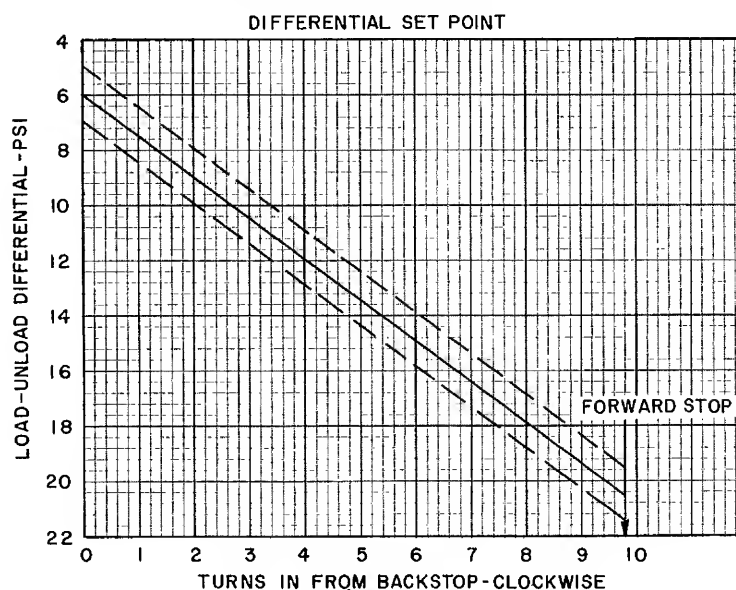


Fig. 28 - Differential Set Point

To Adjust - The differential screw should be turned counterclockwise out to the back stop. If the desired differential is known, the number of turns can be determined from Fig. 28.

#### CHECK THE INSTALLATION

After the unit has been checked for leaks, put into operation, and all adjustments made, check the following:

1. Make sure the shipping bolts have been removed from the compressor.
2. See that the shut-off valves are backseated.
3. Tighten all shut-off valve packing nuts and replace the caps.
4. Pick up all tools and clean up around the unit.
5. Make sure there is adequate air circulation around the unit.
6. Instruct customer in the operation of the unit.